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A. M. A. CONVENTION, ATLANTIC CITY, N. J., JUNE 10-14, 1935

A NEW BABCOCK'S SURGERY

So drastic was the revision for the new (2nd) edition—so extensive was the new material added, so numerous the additional illustrations, that Dr. Babcock's "Surgery" had to be completely reset. The work is virtually new in everything but Title and Authorship.

More specific details of the revision, as well as the general plan and scope of the book, will be found in our Advertisement on Page 3. Let us say here, however, that in this revision the original aim of the book has been constantly kept in mind. Dr. Babcock still deals in details rather than in generalities. He still considers the needs of the general surgeon and the physician in general practice. He still places emphasis on the common conditions of everyday surgical practice rather than on the infrequent or unusual, which, however, he has not slighted—not by any means.

Babcock's "Surgery," in its new (2nd) edition, tells and shows how to find out what the surgical condition is, tells and shows how to treat it, both nonoperatively and operatively—all based on long experience in private and hospital practice. For instance the chapter on Spinal and Regional Anesthesia translates into words an experience with over 30,000 injections made in Dr. Babcock's own clinic; the chapter on Peripheral Nerves includes the author's experience with 1,000 cases of nerve injury; the chapter on Empyema records an experience with 900 cases of pyothorax. And so it goes —a book of personal experience into which Dr. Babcock has woven the findings of others.

Further details in SAUNDERS ADVERTISEMENT on Page 3

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PAIN IN BENIGN ULCERS OF THE ESOPHAGUS, STOMACH AND SMALL INTESTINE

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ROCHESTER, MINN.

With the possible exception of some esophageal ulcers, this study deals almost wholly with the experiences of patients harboring peptic ulcers. The symptoms commonly accepted as being diagnostic of peptic ulcer may be experienced by patients who do not have ulcer, and certain intrinsic gastro-intestinal lesions, such as benign tumor or carcinoma, occasionally produce symptoms clinically indistinguishable from peptic lesions. On the other hand, extensive or subacute perforating peptic lesions have often been observed among patients whose histories had lost to an appreciable degree the symptoms previously so characteristic for peptic ulceration.

Although there is a fairly consistent reduplication of characteristics in the syndrome of peptic ulcer, there is nevertheless much variability in the symptoms. This variability does not necessarily represent individual responses to the same morbid process, although changes in symptoms can often be noted in the same patients at different stages of the life cycle of the disease. This paper is concerned with the study of these mutations in order to ascertain whether certain pathologic complications consistently produce a similar behavior of the syndrome experienced by these patients.

It seemed reasonable that, when peptic ulcer passed through the various stages of its life cycle and invaded different depths of the tissues into which it burrowed, it might be expected to produce some definite changes in symptoms; as neighboring organs are invaded and as normal physiologic processes become increasingly disturbed, symptoms might well be assumed to arise which would substitute for or complicate the symptoms included in the original syndrome. Therefore ulcers in different portions of the gastro-intestinal tract were selected for study; the different states of pathologic development were ascertained by direct inspection of tissues and the various pathologic processes were correlated with the symptoms that were actually being produced at the time of laparotomy. By comparing a sufficient number of such lesions with the symptoms that were produced, it was believed that a type of serial section picture could be built up which would permit correlation of the varying changes in the histopathologic life cycle of peptic ulcer with the changing painful experiences noticed by patients harboring such lesions. The usefulness of having accurate information regarding the actually existing pathologic conditions of the lesions under consideration is readily apparent.

By studying with sufficient thoroughness the exact situation of the pain and the course over which it is projected as well as the behavior of symptoms caused by lesions in varying situations and at varying depths of tissue, certain information may become available by which the anatomic and physiologic problems of abdominal pain and its pathways can be better understood.

PATHWAYS AND MECHANICS OF PAIN

Painful impulses arising from peptic ulcers may originate in the wall of the gastro-intestinal tract, course along over sensory bundles in the sheaths of the splanchnic nerves, cross over through the white rami communicantes of the thoracic nerves along the posterior roots, and thus enter the posterior horn of the spinal cord. Pain also may be conducted to the spinal cord over the sensitive cerebrospinal somatic nerves, twigs of which supply the parietal peritoneum and the mesentery. The vagus nerves carry some sensory fibers, but these are probably not very important in telegraphing to the brain painful impulses arising from peptic ulcers.

There are several other pathways by which painful impulses caused by peptic ulcers can leave the abdomen, such as through the ganglionated sympathetic chain or by way of the aortic plexuses, and thence through the rami communicantes to the spinal cord. Furthermore, if these lesions are situated high in the gastro-intestinal tract, the phrenic pathways may be utilized.

Difficulty at once arises, however. when an attempt is made to explain the origin of pain from viscera which ordinarily seem practically insensitive to the stimuli that experience has taught would produce pain on body surfaces. Lennander [1] attempted an explanation of this paradox by suggesting that painful impulses from diseased viscera reached the patient's consciousness through the medium of the parietal peritoneum and its subserous layer over the cerebrospinal sensory nerves. Ross [2] suggested that internal organs gave rise to two kinds of pain: true splanchnic pain, which was felt in the organ from which the afferent impulse arose, and an associated somatic pain, which, he believed, was felt in the cerebrospinal nerves of the body wall which are connected with the same segments of the spinal cord as the affected splanchnic nerve.

Mackenzie,[3] accepting entirely Ross's hypothesis regarding referred somatic pain, denied the possibility

From the Division of Medicine, the Mayo Clinic.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Lennander, K. G.: Weitere Beobachtungen über Sensibilität in Organ und Gewebe und über lokale Anästhesie, Deutsche Ztschr. f. Chir. **73**: 297-350 (June) 1904.
2. Ross, James: On the Segmental Distribution of Sensory Disorders, Brain **10**: 333-361, 1888.
3. Mackenzie, James: Remarks on the Meaning and Mechanism of Visceral Pain as Shown by the Study of Visceral and Other Sympathetic (Autonomic) Reflexes: I. Sympathetic Reflexes, Brit. M. J. **1**: 1449-1454 (June 23) 1906; III. The Mechanism by Which Visceral Pain is Produced, ibid. **1**: 1523-1528 (June 30) 1906.

that the splanchnic nerves could transmit impulses from the viscera interpreted by the brain as pain. Instead he suggested that the viscus sends forth a stimulus over the splanchnic afferent fibers into the posterior horn. There it sets up an area of increased irritability, producing hyperalgesia in the skin of the abdominal wall supplied by the cerebrospinal sensory nerves that enter the affected segment of the cord. This he called a viscerosensory reflex. He stated that an increased stimulus reaching the spinal cord in this way sometimes spreads to the anterior horn cells affecting a motor center, causing contraction of skeletal muscle in the area receiving

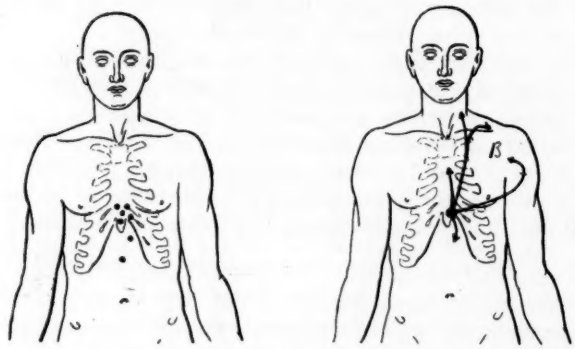

Fig. 1.—Ulcers of the esophagus. Left, origin of pain. Right, radiation of pain. In the charts each dot indicates the point at which each patient felt the maximal distress. Arrows indicate regions to which pain was projected; the depth of shading indicates relative frequency of pain shifts.

its nerve supply from the same spinal segment. This he described as the visceromotor reflex. In this way he attempted to explain rigidity overlying a painful abdominal lesion.

Hurst [4] later pointed out that it should not necessarily be assumed that the viscera were insensitive because certain stimuli applied there were not interpreted as pain. He suggested that it was merely a matter of applying an adequate stimulus to the wall and

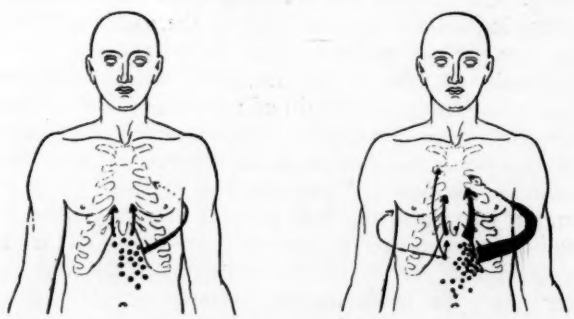

Fig. 2.—Left, nonperforating gastric ulcers, including subacute ulcers. Right, perforating gastric ulcers, not including perforation to liver; the only instance of shift of pain to the right in this group occurred in cases in which the perforation was to the pancreas.

argued that increased tension on the muscular wall of these organs can produce true visceral pain. He expressed the belief that abdominal tenderness associated with ulcer is either a "visceral" tenderness or a "reflex" tenderness. He suggested also that subserous connective tissue in a viscus is sensitive to pressure when inflamed; this he calls visceral tenderness. Reflex tenderness, he stated, is produced by impulses from the ulcer traveling over the afferent sympathetic fibers into the spinal cord, rendering the segments to which they run abnormally sensitive. Local stimulation of the sensory fibers in the skin, subcutaneous tissues and skeletal muscles supplied by the same spinal segment as those of the organ in which the abnormal afferent stimuli originate give rise to discomfort or pain when under ordinary conditions no unpleasant sensation would have arisen from such stimulation.

Morley [5] expressed the opinion that true visceral pain exists, but he suggested that tenderness and rigidity in the abdominal wall are entirely referred from the sensitive cerebrospinal nerves of the parietal peritoneum.

Palmer [6] believes that hydrochloric acid plays a definite part in the production of the pain of peptic ulceration. By introducing 0.5 per cent hydrochloric acid into the stomach of the patients with peptic ulcer, he could produce pain consistently so long as the experiment was carried on during the period in which the ulcer was active. Mann and Bollman [7] expressed the belief that the repeated introduction of 0.5 per cent hydrochloric acid into the stomach, at frequent regular intervals, will eventually produce severe pain. Hurst [4] suggests that hydrochloric acid acts as a stimulus that ultimately raises the tension of muscular fibers in the coat of the viscus, thus causing pain. Kinsella [8] believes that the pain of peptic ulcer is caused by local pressure on

Summary of Material for Study

Type of Ulcer	Cases	Uncomplicated	Complicated	Original Lesion: Gastric	Original Lesion: Duodenal	Recurring Lesion: Gastric	Recurring Lesion: Duodenal
Esophageal	7	..	..	..	..	..	..
Gastric	120	20	40	30	..	30	..
Duodenal	190	55	55	..	40	..	40
Gastrojejunal	70	20	50	3	67	..	..
Gastro-iliac	2	..	..	..	..	..	..
About a Meckel's diverticulum	4	..	..	..	..	..	..

the splanchnic nerves by the inflammatory reactions incidental to the ulcerating process. Wilson [9] is of the opinion that relaxation of the duodenum when the food enters causes relief of pain.

MATERIAL FOR STUDY

Only those cases were accepted for study in which direct inspection of tissues was obtained and in which the history included exact information regarding the syndrome under consideration. These cases are summarized in the accompanying table.

An inquiry was made as to the situation of the lesion and as to the duration and character of the pain, its time of onset, mode of relief, and whether there were any appreciable differences in the general characteristics over the entire life cycle of the lesion under consideration. An effort was made to ascertain the location not only of the more recent areas of pain but also of those experienced since the origin of the syndrome attributed to the patient's present illness. In most instances, dia-

4. Hurst, A. F.: The Goulstonian Lectures on the Sensibility of the Alimentary Canal, Delivered at the Royal College of Physicians on March 14, 16 and 21, 1911, London, H. Frowde, Hodder and Stoughton, 1911.

5. Morley, John: Abdominal Pain, Edinburgh, E. & S. Livingstone, 1931.

6. Palmer, W. L.: The Mechanism of Pain in Gastric and in Duodenal Ulcer: III. The Rôle of Peristalsis and Spasm, Arch. Int. Med. **39**: 109-133 (Jan.) 1927.

7. Mann, F. C., and Bollman, J. L.: Experimentally Produced Peptic Ulcers, J. A. M. A. **99**: 1576-1582 (Nov. 5) 1932.

8. Kinsella, V. J.: The Mechanism of Pain Production in Abdominal Visceral Disease, with Special Reference to the Pains of Peptic Ulcer, M. J. Australia **1**: 64-84 (Jan. 21) 1928.

9. Wilson, M. J.: Duodenal Ulcer: Observations on the Behavior of the Stomach and Duodenum in the Presence of Pain, Arch. Int. Med. **41**: 633-641 (May) 1928.

grams have been used whereon the situation of the distress has been accurately charted. It should here be stated that percentages indicated in the various groups are not mutually exclusive.

ESOPHAGEAL ULCER

The ulcers included in this group were situated just above the cardia. Pain usually was present or intensified during deglutition. Forty-five per cent of the patients noted a shift of pain upward to areas indicated in figure 1. Forty-five per cent gave a history suggesting peptic ulcer.

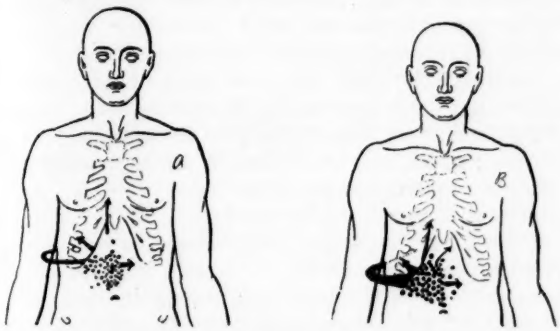

Fig. 3.—Left, nonperforating duodenal ulcers, including subacute and larger ulcers. Right, perforating or deeply penetrating duodenal ulcers.

GASTRIC ULCER

More than 90 per cent of patients with shallow gastric ulcers complained of poorly localizable pain. Definite localization of pain was possible in 50 per cent of cases in which the ulcer was large or subacutely inflamed. In 90 per cent of cases in which the ulcer was perforating, the pain was accurately localizable to the left upper abdominal quadrant, usually near the costal margin. With invasion of the mesentery, mesocolon or abdominal wall, 93 per cent of patients noted secondary shifts of pain into the thorax or back (fig. 2).

DUODENAL ULCER

Obstructing duodenal ulcer usually produced diffuse epigastric distress, frequently with a loss of the sequence of symptoms assumed to be diagnostic of ulcer. In 64 per cent of cases of nonperforating ulcer, the situation of the distress was poorly defined. Extensive or subacute ulcers frequently produced accurately localizable pain. In 90 per cent of cases, perforating duodenal ulcers produced pain which was localized with accuracy to the right upper abdominal quadrant. Seventy-seven per cent of patients with perforating lesions experienced a shift of the pain to the region of the liver or into the back (fig. 3).

GASTROJEJUNAL ULCER

Pain caused by shallow ulcers in or about a gastro-enteric stoma is usually poorly localizable. Patients with perforating ulcers that involved a gastro-enteric stoma had definitely localizable pain, and furthermore they noted shifts of the pain into the lower portion of the abdomen or into the back in 88 per cent of cases. In 96 per cent of cases, patients who harbored perforating ulcers that were definitely jejunal in situation noted a downward or posterior projection of that pain. The situation of pain caused by perforating stomal ulcers that invade the anterior abdominal wall is usually on a higher level than in those cases in which such ulcers perforate posteriorly (fig. 4).

ULCER OCCURRING ABOUT A MECKEL'S DIVERTICULUM AND GASTRO-ILIAC ULCER

The symptoms caused by an ulcer occurring about the orifice of a Meckel's diverticulum presented none of the characteristics usually attributed to peptic ulcer. When such ulcers were perforating, the pain was fairly well localized in an area to the right or left of and slightly below the umbilicus. The two gastro-iliac ulcers occurred in cases in which anastomosis had not been correctly made between the stomach and the ileum before the patients had come to the clinic. In both cases the symptoms maintained some of the characteristics usually noted in anastomotic ulcer. In one case the pain was indicated as being to the right of the umbilicus and, in the other, slightly above it. The pain in the latter was referred downward and through to the back, the lesion being a perforating gastro-iliac ulcer.

COMMENT

It should be stated that no definite rules of behavior can be formulated which invariably apply to the pain or the syndrome caused by peptic ulcer. The syndrome caused by such lesions usually maintains its original characteristics so long as there is no decided change in the morbid anatomic characteristics of such a lesion. Let the ulcerating process deeply invade the wall of the viscus, however, so that the serosa and, subsequently, tissues surrounding the gastro-intestinal wall are invaded, and the characteristic picture of peptic ulcer usually becomes somewhat distorted.

The pain of a small, shallow peptic lesion is usually localized with some difficulty unless it produces mechanical disturbances, and this is true regardless of the position of such a lesion. It may produce no pain at all.

When the deeper tissues of the viscus are invaded, the syndrome as a rule becomes more definite and, with the origin of more severe pain, an area of more definite distress can usually be indicated with fair precision.

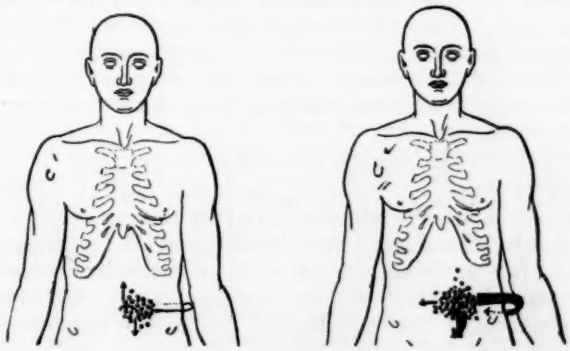

Fig. 4.—Left, nonperforating gastrojejunal ulcers, including large and subacute ulcers. Right, perforating ulcers within or below the anastomosis.

When the inflammatory reaction is extensive, and especially when the lesion has penetrated to the tissues surrounding the viscus, a new area of pain may develop. The second pain may be noted in addition to the original pain, or it may supplant it entirely. Whereas in esophageal ulcer the original pain is in the vicinity of the manubrium of the sternum, it may later extend through to the back or upward into the upper portion of the sternum or into the neck.

In gastric ulcer the pain, in its inception and when the ulcer is shallow, is usually to the left and slightly below the umbilicus. With deep penetration, however,

there usually develops a shift of this pain to a definite area to the left of the median line, frequently approximately at the costal margin, and often there is further projection of this pain into the left portion of the back or upward anteriorly and laterally over the lower ribs. With duodenal ulcer the original pain is usually poorly recognizable, although it is indicated as being above or frequently slightly to the right of the umbilicus.

With the development of subacute inflammation, and particularly when deep penetration occurs, the pain frequently shifts toward the right costal margin, and in addition there often develops projection into the right part of the back or upward into the region of the liver or right side of the thorax. Shallow gastrojejunal ulcers often manifest their presence by pain to the left of the median line or slightly below the umbilicus. When deeply penetrating or perforating, these ulcers frequently produce a shift of pain to the lower part of the abdomen, most frequently to the left side, although occasionally through to the back to a lower area than was the site of pain with the original duodenal or gastric ulcer.

With the onset of this secondary pain, other changes in the characteristics of the syndrome experienced by these patients frequently develop. There is less tendency toward intermittence of symptoms, less relief from distress by the use of food or alkalis, earlier onset of pain following meals, and more distress at night. Frequently, abdominal tenderness becomes noticeable, and a rather persistent sensation of soreness may develop which usually is maximal over the area of pain. Frequently this pain is not in the ulcer sequence, nor is it relieved by food or alkali. This is particularly noticeable when extensive inflammatory reactions pass beyond the confines of the bowel and invade tissues surrounding the viscus. Although extensive or subacute lesions may be productive of the foregoing symptoms, definite penetration progression of the ulcerating process can usually be correctly assumed when the history reveals the presence of such changes from the original symptoms. The projection of pain into secondary areas does not necessarily occur with the development of acute distress. It frequently occurs and may be associated with much tenderness when the pain is and has always been mild.

With the development of obstruction there is frequently much distortion of the usual ulcer syndrome, the pain-food-ease sequence is often lacking, the retention type of vomiting may develop, and, in the presence of such a complication, the distress is usually indicated as diffusely spread out over the epigastrium. This is so regardless of the position of the lesion causing the obstruction.

The presence of several coexisting peptic lesions, if involving different segmental areas, such as an active duodenal ulcer and a gastrojejunal ulcer, may frequently be diagnosed by a careful consideration of the areas to which patients localize their pain. Very important lesions are not infrequently missed because dual pain areas and pain shifts are not carefully evaluated.

A definitely reappearing pain in a well localized area, with consistent projection of the pain to definite areas, may be more accurate than a roentgenogram in pointing out the gastro-intestinal segment from which such pain arises.

A minute scrutiny of pain is important in the recognition of the disease and of its complications, and in such a crucible of clinical experience the theories regarding mechanics and pathways of such pain can be tested and applied. I have been impressed by the consistently recurring pain and pain projection experienced by various patients with lesions of identical histopathologic characteristics. The uniformity of these subsequently developing changes in situation and projection, depending on the depth of tissues invaded, is too definite to be a mere coincidence. Data are thus available to test theories and to ascertain whether they harmonize only with a single fact relative to the problem of pain in peptic ulcer or whether they are sufficiently flexible to be applicable to the problem of the varying behavior of this pain under different pathologic conditions. Among other considerations regarding the ulcer problem it should be clear why the pain of an ulcer that involves only the wall of the viscus, without extension to neighboring organs, should give an indistinctly localizable pain which only exceptionally shifts to other areas. It should explain, on the other hand, why the pain of an ulcer that invades neighboring tissues in the course of perforation should produce definite shifts with projection to secondary areas. It should lend itself to the explanation of why ulcers originating in identical tissues produce a definite posterior and lateral shift of pain when they penetrate to the mesentery and yet produce less definitely projecting pain that is on a different level when they perforate to the anterior abdominal wall.

It must also explain why the approved syndrome of ulcer may be present in the absence of ulcer, and why on the other hand extensive, subacute perforating peptic lesions frequently retain only the fragments of the syndrome that is assumed to be so characteristic of peptic ulceration.

A solution of these problems is not readily discernible in the hypothesis of Mackenzie.[3] The splanchnic accumulation of pain impulses, and the relay of these peripherally as pain over the spinal sensory nerves, could be applied to explain some of the pain experienced by patients with ulcer. Mackenzie, when he formulated his hypothesis, did not believe that the splanchnic nerves carried sensory fibers. At the present time it seems an established fact that some sensory branches run along these splanchnic nerves.

The varying shifts of pain that occur when ulcers venture beyond the confines of the bowel can probably be explained more satisfactorily by the assumption of other routes than the splanchnic nerves. The hypothesis of Morley[5] better fits the interpretation of the pain behavior of perforating ulcers. He suggested that such pain is picked up by the sensory spinal nerves and transmitted to the superficial branches of such nerves. He would classify the shifting distress of a perforating ulcer as a "referred pain." Regarding the origin of such pains he stated that "referred pain only arises from irritation of nerves which are sensitive to those stimuli that produce pain when applied to the surface of the body." He assumed that tissues such as the mesentery, mesocolon and abdominal wall are innervated by the sensory spinal nerves, a presumption which clinical experience would lead me to assume is entirely reasonable. I have noted, however, although I must admit that this occurred rarely, that projecting pains exactly similar to those observed in ulcers that invade tissues external to the bowel occasionally arise in ulcers that invade serosal tissues, and even rarely in ulcers which, although extensive, are not penetrating. This

could, of course, be explained on the basis of direct invasion of such tissues by products of inflammation or by unusually distended viscera, but I am not convinced that pain transmitted over the splanchnic route cannot be projected into secondary areas.

The slightly upward, left, lateral and posterior shift of the pain of gastric ulcer, the right, lateral and posterior shift of the pain of duodenal ulcer, and the downward, slightly lateral and posterior shift of the pain of jejunal ulcers all conform fairly well to peripheral areas supplied by somatic branches that could be expected to be invaded by posterior perforation of such lesions. In this connection the behavior of pain caused by lesions perforating to the anterior abdominal wall is interesting. In such instances there is local tenderness and rigidity, frequently a palpable mass, and the pain has less tendency to project widely. It is designated almost invariably as occurring in areas contiguous to the spot into which the penetrating lesion had attached itself. Furthermore, it is usually on a definitely higher level than is noted by patients having ulcers in identical positions but which perforate posteriorly.

It would seem that the most reasonable explanation for the various and varying situations and references of pain caused by peptic ulcer would have to assume at least a dual nervous mechanism. The simple, clean-cut, uncomplicated peptic ulcer may well be a visceral syndrome caused by rhythmically reasserting "adequate" stimuli and appreciated by means of afferent conducting mechanisms within the sympathetic nervous system.

The diffuse epigastric distress that is almost universally noted with obstructing ulcers, regardless of the position of such ulcers in the stomach, duodenum or jejunum, in all probability arises because of disturbed intragastric mechanics or disturbances in the stomach wall which could be a visceral phenomenon that would seem to be transmitted mainly along the sympathetic nerves.

With invasion, in the progress of perforation of tissues surrounding the wall inhabited by a peptic ulcer, it would seem that the warnings of the traumatizing effects of such invasion would be conducted over nerves guarding these tissues, which would probably be branches of the somatic nerves. These nerves being sensitive to many stimuli, in addition to the adequate stimulus producing pain over the splanchnic route, could be expected to produce a syndrome less rhythmic and clean cut than the syndrome caused by an uncomplicated ulcer.

The fact must not be lost sight of that, even though a perforating ulcer gets beyond the confines of its place of origin, it is still setting up irritation to the wall of the viscus. Thus impulses would be collected from both sources; that is, over the splanchnic and over the somatic nerves.

It is readily conceivable that the syndrome of peptic ulcer might well be influenced in this way. A disturbed ulcer syndrome, that is, one in which the symptoms are mainly over areas supplied by somatic nerves, could easily be assumed to receive predominance of impulses from without the bowel wall over branches from this system of nerves, whereas a pick-up of sensations over the splanchnic nerve plexuses not distracted by a mixture of impulses arising over the somatic nerves might conceivably be assumed to produce a syndrome usually accepted as being a characteristic peptic ulcer complex of symptoms. Much additional evidence will have to be used by physiologists, anatomists, surgeons and clinicians before the final analysis of these varying phenomena associated with peptic ulcer and its syndrome will have been satisfactorily explained.

CONCLUSIONS

1. The clean-cut syndrome usually accepted as being diagnostic of peptic ulcer indicates an uncomplicated ulcer.

2. When the pain of gastric ulcer shifts definitely to the left, slightly upward or to the back, when the pain of a duodenal ulcer is projected toward the right, upward over the region of the liver or through to the back, or when the pain of a gastrojejunal ulcer extends downward or through to the back, one can usually correctly assume deep penetration or partial perforation of such a lesion.

3. The presence of two distinctly separated areas of pain, especially if such pain is projected into two widely separated areas, frequently is indicative of two peptic lesions, such as an associated duodenal ulcer and gastrojejunal ulcer or an associated gastric ulcer high on the lesser curvature and a perforating duodenal ulcer.

4. The situation of the pain of an obstructing ulcer, regardless of the situation of the lesion, is usually diffusely spread out over the epigastrium.

5. Uncomplicated peptic ulcer probably indicates its presence as a visceral phenomenon, which asserts itself over the splanchnic nerves.

6. The projecting pain of perforating peptic ulcers are in all probability the result of direct stimulation of the somatic nerves with a relay of these impulses as pain into the peripheral or cutaneous branches of such nerves. It is conceivable that the distortion of the approved ulcer syndrome in such instances is influenced by the accumulation of impulses of varying intensity over both the splanchnic plexuses of nerves and over the somatic nerves.

ABSTRACT OF DISCUSSION

DR. RALPH C. BROWN, Chicago: Dr. Rivers has clearly outlined the extent to which confusion still exists among physiologists with respect to the precise mechanism of peptic ulcer pain. However, a mass of accurate clinical data is now available, established facts that are of the greatest value in differential diagnosis. It is known that an ulcer not complicated by an extensive perigastritis gives rise to pain or distress only when free hydrochloric acid in considerable concentration is in contact with the exposed surface of the ulcer. Free hydrochloric acid is without doubt the direct irritant that initiates the pain. As a striking illustration I would cite two cases of gastrojejunal ulcer recently under my observation. With clocklike regularity about one and one-half hours after food-taking, pain would appear in the left testicle, would increase to almost agonizing intensity, and would continue until relieved by giving the patient food or an alkali. Relief of the testicular pain in these patients by hydrochloric acid neutralization was immediate and complete. In these two cases the left renal nerve supply had become involved in the inflammatory mass surrounding deeply penetrating jejunal ulcers. The nerve supply to the kidney and to the testicle is derived mainly from the sympathetic through the solar and aortic plexuses and from the splanchnics. It would be difficult to explain the testicular pain in these cases of jejunal ulcer on any basis other than direct chemical irritation of the renal nerves thus exposed in the base of these ulcers. The relief from alkalis was immediate and complete. It seems to me highly improbable that the pain of ulcer can be explained on the basis of increased intragastric tension. In certain cases of high grade pyloric obstruction of long standing, with great hypertrophy of the stomach musculature, the visible and palpable gastric peristalsis forms globular masses having almost the

firmness of a grapefruit. The intragastric tension at such a time must be very great, yet no discomfort is experienced by the patient. I do not believe it is possible to determine accurately the location of an ulcer by the localization of the pain or distress. The characteristic response of the patient with an active ulcer, whether gastric or duodenal, when asked to indicate the site of distress, is the unhesitating placing of one or two finger tips at one definite point in the epigastrium. True, this point will vary in different individuals, but most commonly it is in the midline. Less than 10 per cent of patients with active ulcer will indicate the site of distress with the palm of the hand. This point is of definite diagnostic value, especially in differentiating the pain of ulcer from that caused by a spastic bowel.

DR. FRANK SMITHIES, Chicago: It is necessary to diagnose not only peptic ulcer but its localization as well. If it is in the stomach, the prognosis is different from that of an ulcer in the duodenum. There is the greater possibility of serious complications when the ulcer is gastric. Likewise the histologic state of the ulcer must be diagnosed. This is most essential with regard to the exhibition of proper treatment. By the time the gastro-enterologist sees the patient, his clinical story is that of what happens in consequence of various types of complications: these all affect what happens secretorily, from the standpoint of motility and interference with general nutrition. Hence the symptomatology of progressive ulcer is an ever changing one; so are the special laboratory observations. Dr. Brown has emphasized how mild may be the symptoms of chronic ulcer, and he has done that, I am sure, with the object of emphasizing the fact that chronic ulcer is not especially a mucosal disease. It is a mural disease: a periduodenal and a perigastric disease. I want to point out an observation which I think is important. Sometimes one sees a patient with pain diffused over an area requiring a hand to cover it. If that patient begins to have marked distress in one place, and it begins to have a definite point of reference to the back, up to the teeth (I have seen teeth taken out because such pain supposedly was due to bad teeth), to the shoulder, to the nipple, or is angina-like, and if the pain reference point always is to one place, the clinical interpretation is that a histologic complication is occurring in the ulcer whether the lesion is gastric or duodenal. When, in addition to the constancy of the patient's description of distress, one elicits local tenderness, one is being told by a pathologic process that there is a histologic change going on and that one is dealing with something entirely different in the ulcer. In such circumstances one may expect serious consequences to occur even though at intervals the patient is in the greatest of comfort. The lesion has passed from its mucosal to a definitely mural stage, with possibilities of serious vascular or motor accidents. The author did not emphasize the point of reference of pain by the patient to the region in which tenderness is noted, but what I have suggested is a hint. Relief of pain in ulcer doesn't concern physicians today. There are many mechanisms—the Christian scientist, a highball, a lot of alkali, a baseball game and so on. The mechanism of relief varies with the individual, and possibilities for relief frequently depend on the histologic status of the ulcer at the particular time.

DR. SIDNEY K. SIMON, New Orleans: One of the inferential points brought out in Dr. Rivers' splendid contribution is the stress that he lays on a purely clinical phenomenon in the diagnosis of ulcer. The great tendency in recent times in the diagnosis of gastro-intestinal conditions has been to stress largely the laboratory phenomena, very often at the expense of clinical interpretations. Dr. Rivers shows clearly the importance of just one simple phase of the clinical data, and that is the proper interpretation of the pain location. I should like to ask the author what his impression is in regard to the localization of points of tenderness, in relation to the somatic description of the pain by the patient. The older clinicians learned to depend to a certain extent on the location of areas of sensitiveness for the differentiation of the gastric from the duodenal ulcer. The description of the painful area along the spinal column, or to the left, rather, of the spinal column, by Bowers, has been stressed, and I should like to know from Dr. Rivers whether he has correlated in any way in his own observations these various areas of sensitiveness, or head zones or Boas's points in relation to the differential diagnosis of the different phases of peptic ulcer.

DR. A. H. AARON, Buffalo: The responsibility of the correct interpretation of pain rests with gastro-enterologists. I will mention two cases. A woman had a sudden terrific pain in the upper part of the left diaphragm, referred to the neck, and was in shock. The diagnosis was made of a perforated lesion of the stomach and gastrostomy was done. She died. An ulcer was found at the junction of the cardia in the stomach, which had perforated and also crowded a large vessel. She had the typical referred pain to which Dr. Capps called attention, which she could reproduce by mechanical stimulation of the inner portion of the diaphragm, which received its enervation through the phrenic, and referred pain to the neck. In the second case the situation was more serious. A man had terrific pain referred to the neck. It was diagnosed as coronary thrombosis, but what he actually had was an ulcer in the esophagus. The patient unfortunately presented cardiographic changes, was in collapse, had referred pain such as Dr. Rivers described, and was on a restricted regimen for a long time. He altered his whole conduct in life, the character of his activities, and what he really had was revealed on examination of the esophagus to be a peptic ulcer of the esophagus. The referred pain was due to that. He had somewhat of an effort syndrome associated with his pain.

DR. ANDREW B. RIVERS, Rochester, Minn.: Dr. Brown intimated that it is not always possible to localize ulcers correctly from the situation of their pain. This is particularly true with ulcers that do not have penetrating characteristics. If ulcers are of the penetrating variety, it is frequently possible to localize with a fair degree of accuracy the position of the lesion. However, this does not preclude the necessity for corroborating such impressions by roentgenologic investigations; if an ulcer has been localized under the fluoroscope and these pain shifts occur, the probability of a complicated histopathologic condition of the ulcer is suggested. There are still many things regarding the mechanism of pain production in ulcer that are unsettled. There seems no doubt that acid is one of the chemical causes for the production of pain. However, whether acid is responsible for the production of pain by bringing into play some other related mechanism, such as spasm, is not finally determined as yet. Regarding the matter of tenderness in peptic ulcer, I doubt that the situation of such tenderness always corresponds to the position occupied by the ulcer. There are some suggestions that in extensive peptic ulcers there may be visceral tenderness. On the other hand, it seems likely that in most instances the tenderness associated with penetrating lesions is due to actual somatic invasion. This may be due to direct peritoneal irritation, or it may at times be felt along the distribution of the somatic nerve affected by such nerve irritation.

The Physician of the Gods.—The Romans followed the Greeks in regarding Phoebus Apollo, the physician of the gods, as the inventor of medicine. By the nymph Coronis, who seems to have indiscreetly joined the god while he was bathing in a river, Apollo had a son, Aesculapius. He entrusted the education of the boy to the centaur Chiron, who taught his charge the art of medicine. Arrived at manhood, Aesculapius performed many miracles of healing, but his very efficiency proved his undoing. It happened in this way: The seer Polyidus, while watching by the body of the dead Glaucus, saw a snake approaching and promptly killed it. In a few moments, however, he observed a second snake, which drew near its dead companion and touched the lifeless body with an herb that it carried in its mouth. At the touch, the dead snake instantly revived. Polyidus communicated his discovery to Aesculapius, who used the same herb to restore the life of Hippolytus, whose death had been brought about by his incestuous stepmother, Phaedra, the Greek counterpart of Potiphar's wife. Jupiter, incensed that a mortal should usurp the divine prerogative of raising the dead, blasted Aesculapius with a thunderbolt. After his deification a temple was erected for the worship of Aesculapius at his birthplace, Epidaurus, a town in the Peloponnesus, about thirty miles from Athens.—Jeffrey, Eric: The Ancient Romans Through Medical Eyes, *M. J. Australia* **2**:439 (Oct. 6) 1934.

ULCERATIVE COLITIS

II. THE FACTOR OF DEFICIENCY STATES

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During recent years the concept of deficiency disease has been enlarged. It is becoming increasingly apparent that chronic vitamin deficiency produces a variety of vague borderline states of ill health that have no place in existing nomenclature. These conditions, however, seldom appear uncomplicated or well defined. The contributory factors are more complex than those operative in the laboratory, where the environment of the experimental animal is subject to strict control. It is probable, therefore, that the resulting clinical picture in man is not the simple expression of lack of a single factor as a vitamin. Deficient supply of other essential food substances such as protein, iron, calcium, phosphorus and iodine undoubtedly contribute to the syndrome.

We have encountered indications of deficiency disease in forty-seven cases of chronic ulcerative colitis. These observations have been drawn from seventy-five consecutive cases seen in hospital, dispensary and private practice in New York City. They represent all stages of the disease anatomically from mild localized proctitis to advanced and extensive involvement of the entire colon. The clinical expression has varied from the mild form with relatively slight symptoms to the very severe type requiring prolonged periods of hospitalization and, at times, surgical intervention.

In most instances the phenomena suggesting deficiency disease have not been associated with a clinical picture that coincides exactly with any of the well recognized conditions usually included within this group. The diagnostic criteria that we have adopted have been restricted to the objective changes that have been shown to occur in various deficiency states. They find expression particularly in the mucous membranes of the mouth, in the skin, in changes in the blood chemistry, and in the associated anemia.

Alterations in the mucous membrane of the tongue have been the most common of the abnormal manifestations. They appear to be among the earliest recognizable indications of deficiency disease. They present the features that are characteristic of sprue, pernicious anemia and pellagra. The initial phase begins as an inflammation of the fungiform papillae over the anterior third. This causes them to stand out with undue prominence and leads to a strawberry-like appearance. If progression occurs, a diffuse glossitis develops in which the anterior portion of the tongue becomes inflamed, red and often tender. At this stage small, painful, aphthous ulcers may appear and may be present also on the buccal mucosa. Ultimately, as is the case in sprue, the filiform papillae degenerate and the characteristic smooth atrophy of the tongue results. More rarely, and only in the advanced and serious cases, the inflammatory process has extended to involve the mucous membrane of the mouth, producing a condition indistinguishable from the diffuse stomatitis of pellagra.

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These changes are relatively slight in many instances and may easily escape notice. The smooth atrophy is frequently restricted to the tip and to the edges of the tongue. It is seldom as prominent as in addisonian anemia.

Eleven of the patients have presented abnormal conditions of the skin. These individuals, with one exception, were seriously ill. The cutaneous phenomena that appeared in the course of prolonged hospitalization did not exhibit the characteristics of infection or of response to common irritants. They were preceded or accompanied by other clinical indications of deficiency.

Alteration in the texture of the skin has been the most common change observed. It becomes abnormally dry and scaly, especially over the extremities. This is frequently associated with hyperkeratosis follicularis and a harsh, almost sandpaper-like skin surface. With general clinical improvement these phenomena have receded and have given place to normal soft and elastic integument.

Symmetrically disposed atrophy of exposed skin surfaces has been noted in five of the patients. This has usually, but not invariably, followed exposure to sunlight. The changes, however, have been noticeably disproportionate to the degree of sunburn. This has been most evident over the dorsum of the hands. In one case, however, the scapular region was similarly affected and in another the greater portion of the extremities was involved. The skin in these instances is dry, wrinkled, parchment-like and transparent.

TABLE 1.—*Indications of Deficiency Disease in Forty-Seven Cases*

Tongue	46
Buccal mucosa	4
Skin	11
Blood chemistry	7
Anemia	40
Peripheral neuritis	1

We have noted a variable type and degree of dermatitis in three of the cases. One patient developed a classic pellagra after exposure to the sun, with acute inflammation of the exposed areas and an acute diffuse stomatitis. These phenomena cleared rapidly on the parenteral administration of liver extract. Pigmentation followed the cessation of the inflammatory process in the skin. The other cases probably represent incipient pellagra. In one a symmetrical smarting dermatitis appeared over the metacarpophalangeal joints of both hands and over both heels. In the other, a similar process developed over the extensor surfaces of the elbows and over the anterior surface of both knees. In two instances a brownish discoloration of the face and flanks appeared without antecedent dermatitis, analogous to the pigmentation in sprue.

A discrete maculopapular erythematous eruption developed in two patients during their stay in the hospital. In neither instance did these changes follow on exposure to any known etiologic agent, and the consulting dermatologist was unable to classify them with certainty. The individual lesions varied from a few millimeters to a centimeter or more in diameter. They were reddish brown or copper colored, discrete, slightly raised and indurated but not tender, painful or itching. They were largely restricted to the extensor surface of the hands, forearms and arms, and the calves of the legs. There was no involvement of the palmar surface of the hands, the lesions appearing only on the

dorsum. Liver extract seemed responsible for their disappearance in the one case in which it was used.

An extensive and spreading skin gangrene of the flank occurred suddenly following ileostomy in another patient, who presented changes in the buccal and lingual mucosa strongly suggestive of pellagra. The initial focus of the gangrenous process was not immediately adjacent to the operative field and multiple secondary foci appeared, which were completely surrounded by normal skin. These changes could not be attributed to trauma, mechanical or chemical, and aerobic and anaerobic cultures failed to throw light on the etiology.

TABLE 2.—*Oral Lesions in Forty-Six Cases*

Inflamed lingual papillae	31
Aphthous ulceration	8
Smooth atrophy of tongue	29
Diffuse stomatitis	4

Both the protein and the mineral metabolism of the body may be seriously disturbed in the advanced stages of chronic ulcerative colitis. Blood chemistry determinations have shown marked deviations from normal in seven cases. These patients were seriously ill and without exception presented other indications of deficiency disease. The total plasma protein was below normal limits in four. In three of these this change was associated with inversion of the albumin-globulin ratio and extensive edema. The serum calcium values were lowered in four cases. However, this reduction was not sufficient to induce clinical evidence of tetany. The total base was below normal in one patient who presented a severe grade of malnutrition.

Thirty-nine of the seventy-five cases have shown significant grades of anemia. In thirty-one the characteristics of the hypochromic microcytic type were constantly present. The color index remained uniformly below unity, the average cell diameters, as measured by the Eve halometer, were low, and microcytes predominated in the stained smear.

Eight of the cases, on the other hand, have presented an anemia that is difficult to classify. All but one of these patients exhibited other evidence of deficiency states. The color index has varied irregularly to both sides of unity when followed over a period of months. With indexes at unity or above, the average cell diameter has tended to exceed 7.5 microns and the stained smear has shown varying numbers of macrocytes. These variations persisted until liver extract was added to the therapy. With this, the index has remained constantly at lower levels and the stained smear has presented the characteristics of the simple or iron deficiency anemias. The gastric acidity studies are inconstant in this group. In two patients a normal response to histamine was obtained. Hypo-acidity was present in one, and complete anacidity in four. Four of these patients showed varying degrees of smooth atrophy of the tongue. There was no evidence of subacute combined sclerosis.

These phenomena in the buccal mucous membranes, the skin and the blood have been observed in various deficiency diseases in man. Although the association does not prove conclusively that these changes result from the deficiency, accumulating clinical experience supports the belief that they may be accepted as dependable indications. Determination of the specific factor or factors responsible for the development of a particular lesion is quite another matter, however. The results of experimental studies have frequently been contradictory. Much of the early work in nutrition must be reevaluated in the light of subsequent knowledge. Diets that were believed to be deficient in one principle have later been shown to be lacking in several. Consequently the original deductions are inaccurate.

Inadequate supply of the vitamin B complex seems to play a part in the production of lesions in the mouth. Hutter, Middleton and Steenbock [1] have regularly produced smooth atrophy of the tongue in rats maintained on diets that were believed to be complete except for vitamin B_2, or G. On the other hand, Zimmerman and Burack [2] have studied the effect of what they consider to be an uncomplicated B_2 deficiency in dogs. Weight loss, vomiting, diarrhea and muscular weakness developed in the animals, finally ending in death. They found lesions of the nervous system, an intact gastrointestinal mucous membrane, and no evidence of dermatitis, gingivitis or glossitis. The cutaneous and oral lesions of pellagra are believed to be closely related to deficiency of this substance and have been shown to respond to the continued administration of various preparations of liver.[3] Regeneration of atrophic lingual papillae in man has been observed when a good source of the B complex such as yeast is added to the dietary. Similarly, the oral or parenteral administration of liver extract has been followed by restoration of the tongue to normal.[4] In our cases the feeding neither of yeast nor of liver extract has seemed completely effective. When given intramuscularly or intravenously, however, the latter has checked the aphthous ulceration and the diffuse stomatitis. Progressive regeneration of the atrophic lingual papillae has resulted when it was administered over a sufficient period of time.

It is probable that skin lesions other than the dermatitis of pellagra are related to a deficient supply of these vitamins. Cowgill, Stucky and Rose [5] reported that in dogs kept for long periods on diets adequate except for the entire vitamin B complex, cutaneous lesions developed, which frequently were symmetrically disposed. These at first were slightly raised, round or oval, and in many instances subsequently ulcerated. Healing followed the addition of yeast to the diet without other therapy. Rhoads [6] has seen gangrene of the skin associated with severe pellagra in Puerto Rico.

TABLE 3.—*Skin Lesions in Eleven Cases*

1. Dry scaly skin	8
2. Hyperkeratosis follicularis	6
3. Symmetrical atrophy	5
4. Symmetrical dermatitis	3
5. Pigmentation	3
6. Discrete erythematous eruption	2
7. Skin gangrene	1

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The significance of the discrete, symmetrically disposed skin eruption and of the one case of skin gangrene that we have observed is difficult to determine accurately. However, the association with other more dependable indications of deficiency disease suggests that they result from the same mechanism.

Deficiency of vitamin A has been shown to produce epithelial hyperplasia, metaplasia and keratinization.[7] Hyperkeratosis about the hair follicles, particularly on the extensor surfaces of the arms and legs and over the abdomen, has been attributed to lack of this factor. The sweat and sebaceous glands atrophy. The epithelium of the hair follicles undergoes keratinization, causing it to project as a plug above the surrounding skin surface.[8] The skin becomes dry, scaly and shriveled.[9] These changes, together with acneform eruptions, have recently been observed associated with night blindness and xerophthalmia. Both the cutaneous and the ocular phenomena disappeared on the addition of cod liver oil to the dietary.[10] Although none of our cases have exhibited xerophthalmia or night blindness, recent work indicates that these conditions probably result from advanced grades of deficiency and that minor degrees of vitamin A deprivation are not uncommon in the general population.[11]

The abnormal blood chemistry studies and the disturbed fluid balance may represent an inadequate available supply of protein and of electrolytes or an excessive loss of these substances from the body. The edema that we have observed in these cases exhibits the characteristics of the so-called nutritional, or war, edema. This results from the change in osmotic relationships attendant on reduction of the blood proteins. Moschcowitz [12] has encountered this condition in three cases of ulcerative colitis with chronic diarrhea. He considered the protein deficit to be the result of exudation of serum from the ulcerated surface of the colon. While this constant loss unquestionably plays a part, we believe that the deficient available supply is also a factor of some importance.

The cases with varying color index anemias and inconstant macrocytosis suggest an irregular and slight deficiency of the hematinic principle requisite for normal erythropoiesis. Since the diets of these patients were rich in extrinsic factor, the defect must lie in insufficient production of intrinsic gastric factor or in imperfect absorption from the intestine. The net effect, however, appears to be intermittent in action and insufficient to produce the complete picture of true macrocytic anemia, although the blood picture borders on this condition.

These varied indications of deficiency disease have appeared in spite of dietaries that are completely adequate for the normal individual. Stool examinations have not revealed sufficient evidence of faulty digestion to account for their occurrence. Consequently our attention was attracted to the function of the small intestine. It seemed possible that one or both of two factors might be responsible for the development of deficiency states in the presence of a complete diet. Hypermotility might cause too rapid a rate of passage through the tract, or a defect in the absorbing mechanism might offset an apparently adequate diet.

Twenty-nine of thirty-seven cases studied roentgenographically have shown significant changes in the small intestine. These frequently extend from the duodenum to the ileocecal junction. The normal mucosal pattern is distorted, as though the mucosa, and especially the valvulae conniventes, were edematous. There is dilatation of individual coils and groups of coils without evidence of obstruction. There is disorganization of normal motor function with reduction of activity and uncoordinated muscular contraction. No evidence of ulceration of the small intestine has been obtained. These changes have been constantly present and most marked in patients with advanced grades of deficiency disease.[13]

Exact interpretation of these studies of the small intestine is impracticable at present. There are clinical and experimental observations, however, which suggest that they may themselves be the expression of deprivation of the vitamin B_1. Anorexia has been a troublesome clinical problem in many of our cases. This symptom has been shown to be one of the most characteristic effects of partial deprivation of the antineuritic vitamin, and it appears well in advance of polyneuritis.[14] We have encountered the latter condition in only one case. Furthermore, reduced motor activity of the intestinal tract has been observed in animals on the withdrawal of this vitamin from the diet.[15]

TABLE 4.—*Blood Chemistry Determinations in Seven Cases*

Low plasma proteins	4
Inverted albumin-globulin ratio	3
Low serum calcium	4
Low total base	1

Deficiency states have been observed in ulcerative colitis in the past. Jones [16] considers them not infrequent, and Dickson [17] and Larimore [18] have suggested that avitaminosis might play an important rôle. However, the clinical pictures of the recognized deficiency diseases are relatively infrequent. The lack of correlation between the objective phenomena developing in animals on experimental diets and those observed in man have interposed obstacles to the development of this concept. Although the experimental evidence is striking, clinical experience has not supported the view that avitaminosis may operate as a primary cause of the disease.

Our studies, on the other hand, lead us to believe that deficiency states play an important part in the

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mechanism of chronic ulcerative colitis. We have observed indications of such conditions in 62.6 per cent of our cases. The lack of clinical signs of deprivation in the remaining cases suggests that the factor of deficiency is secondary rather than primary. The serious chronic cases have invariably presented moderate to marked grades of deficiency disease. The general clinical improvement attendant on control of this factor indicates the importance of specific therapy. The development of these conditions despite a balanced diet suggests that they result from some fundamental disturbance of physiology secondary to the diseased colon. The changes demonstrable in the small intestine may impair the absorption of the normal end products of digestion and so give rise to the paradox of deficiency in the face of adequate intake. In support of this possibility we have observed identical changes on roentgen examination of the small intestine in three cases of sprue, a disease that is characterized by blockage of the absorptive mechanism.[19]

We believe, therefore, that deficiency disease is not to be regarded as an occasional complication of chronic ulcerative colitis. It seems more probable that it constitutes an essential part of the underlying mechanism. With the appearance of indications of deficiency disease the pathology changes; the symptoms become more complex, the clinical picture more severe, and the prognosis more grave. In many instances the evidence does not permit definite evaluation of the rôle of single vitamins or specific food substances. The clinical phenomena suggest, however, that the deficiencies are multiple rather than single. Inadequate supply of vitamins A, B_1, B_2 and possibly D, together with lack of biologically complete protein, and of electrolytes, appears to contribute to the complex clinical picture in varying degree. The progression that many of the patients have shown under prolonged observation suggests that the potentially severe and untreated or imperfectly treated case tends to pass through three stages. In the initial phase clinical evidence of deficiency disease is lacking. The second stage is characterized by the appearance of early signs of deficiency. In the third stage, which is relatively rare, deficiency disease is severe and tends to dominate the clinical picture.

CONCLUSIONS

1. Evidence of deficiency states has been observed in 62.6 per cent of seventy-five cases of chronic ulcerative colitis.
2. These indications find expression in the buccal and lingual mucosa, the skin, the type of anemia and the blood chemistry.
3. When present in advanced degree they have invariably been associated with characteristic changes in the small intestine.
4. Secondary, or conditioned deficiencies appear to be important factors in the pathologic physiology of the disease.

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THE CRITERIA OF CURE OF GONORRHEA IN THE MALE

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There is no phase of the management of cases of gonorrhea that gives rise to more anxiety to the clinician than the period of probation preceding the decision as to cure. There are few errors that may be fraught with such disastrous consequences to the patient and his family, and to the reputation of the doctor, than an error in this important decision. Yet only too commonly it is found that, without adequate thought and without careful observation, this heavy responsibility is readily and lightly accepted.

In the time at my disposal I propose to enumerate the various points that must be considered in approaching such a decision, to give my views based on clinical observations in conjunction with certain improved pathologic tests, and to provoke discussion of those controversial points by which new light may be thrown on this old problem.

The tests of cure may with propriety be divided into two chronological groups, the classic and the modern. The classic group of tests are in the main clinical and imply a searching physical examination of the lower urogenital tract. Briefly, the requirements are an absolutely clear urine both by gross and by microscopic tests, negative endoscopic examination, absence of any evidence of inflammation in the urethra, testes, prostate and seminal vesicles, and a prostatovesicular fluid containing no organisms and not more than 5 white cells to the high power field. These requirements sound reasonable enough, yet it is my belief that a majority of patients affected with gonorrhea cease treatment before achieving these classic standards of cure. Of those who measure up to these requirements many have been found, on follow up, to develop recurrences or metastatic lesions or to infect a sexual partner. It has become more and more obvious, as apparently cured cases are followed over long periods, that the classic tests furnish a most insecure index of cure. In the past many attempts have been made in the direction of greater accuracy in diagnosis of residual or latent infection; thus, the complement fixation and cultural methods are quite old—actually the complement fixation test was introduced in 1906. It is only in recent years, however, that intensive work all over the world has led to the perfection of the complement fixation and cultural methods, thus providing a secure pathologic test of cure.

These modern tests demand a high degree of accuracy and experience on the part of the pathologist. They are of course complementary to the clinical tests and in nowise supplant them.

CULTURAL TESTS

Experience shows that cultural tests of the prostatic fluid alone are not reliable. Every effort should be made to obtain as much as possible of the contents of both prostate and seminal vesicles.

Much recent clinical and pathologic evidence points to the fact that infection of the seminal vesicles occurs in a considerably higher proportion of cases than is generally stated. A detailed discussion would be out of place here, but at least the careful microscopic and

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cultural examination of both fluids requires no extra effort and will give more accurate results.

The technic of culturing the gonococcus from the vesiculoprostatic contents in the chronic stage of gonorrhea is due to work of Dr. Orpwood Price, pathologist to the Whitechapel Clinic, and has been in routine use for the last two years. The procedure is as follows: The patient passes urine and the anterior urethra is then irrigated with sterile water. The patient assumes the knee-elbow position and the prostate and seminal vesicles are massaged thoroughly. As much as possible of the expressed fluid is allowed to drop on the surface of a culture medium contained in a petri dish. The cover of the dish is replaced and the surface is slanted in all directions so that the greatest possible area of surface is inoculated. Before inoculation the medium is kept for at least half an hour in the incubator at 37.5 C. and is replaced immediately after inoculation. The culture is incubated for five days; it is premature to examine for gonococci before this period has elapsed. A variety of organisms may be present but the most constant feature is a profuse growth of Staphylococcus albus. Owing to the strong secondary growth, the gonococcus colonies may be difficult to distinguish without the use of a differential stain. For this purpose the oxidase reaction is employed.

The oxidase reaction was first used for differential diagnosis in bacteriologic work by Gordon and McLeod in 1928 and was adapted by Price to the isolation of the gonococcus in mixed culture in 1929. Briefly, the test depends on the interaction of the oxidizing ferments in certain organisms and a reagent—in this case 1 per cent dimethylparaphenylenediamine hydrochloride in distilled water, which produces a color reaction. The solution should be freshly prepared.

This solution is poured over the surface of the medium so that it comes into contact with all the surface growth. A positive reaction is shown by certain colonies developing a pink coloration, which deepens through shades of purple to jet black in about thirty minutes. These colonies can then be picked off and stained by Jensen's modification of Gram's method, when they will be seen to consist of gram-negative diplococci morphologically indistinguishable from gonococci. These are always closely associated with staphylococci, which in the first three days of incubation mask but do not inhibit their growth. Indeed, one of the most interesting features of cultures prepared and examined in this way is the appearance that is constantly seen of the gonococcus colonies growing up through the larger colonies of Staphylococcus albus.

The oxidase reaction is not, of course, a specific test, and other members of the neisserian group give a positive reaction. Of these only Micrococcus catarrhalis gives a closely similar reaction; but this organism is rarely found in the genital tract.

False positive reactions are usually given by a thin filiform type of B. coli, as well as by B. subtilis, but these are easily distinguished by microscopic examination of the organisms when picked off the plates. If difficulty arises it is possible to make an antigen from subcultures and to titrate against a known antiserum.

Culture tests carried out according to this technic have proved most reliable and most informative. Its routine use throws light on many clinical points that have been obscure hitherto, and there is no doubt that it constitutes a very considerable advance in the methods of diagnosis of gonorrhea in the chronic stage. As a test of cure it is invaluable.

It must be emphasized that one negative test is never sufficient and, although this cultural examination has proved to be the most delicate and reliable of tests, it can be accepted as a criterion of cure only in conjunction with negative clinical observations and the other negative pathologic tests.

In our test of cure we apply this test monthly during the period of observation without treatment. A series of four negative tests would be the minimum that could be regarded as satisfactory. In a series of 100 patients without symptoms the test was positive in 100 per cent. What evidence have we for asserting that the gram-negative diplococcus which we recover in our cultures is the gonococcus?

Apart from the skill and experience of our pathologist, the evidence is threefold:

1. The oxidase reaction within the limits I have indicated is specific for this type of organism.

2. The titration of an antigen made from subcultures of the organism against a known gonococcus antiserum will give a positive result to the complement fixation test.

3. We make every endeavor to examine and test the husbands of married women who attend our clinic for vaginal discharges which are clinically and bacteriologically gonococcic.

It is a frequent experience that the husband of such a patient has no signs or symptoms of gonorrhea but gives a history of urethritis some years previously. In such cases we are able, almost invariably, to recover this organism in vesiculoprostatic culture.

THE COMPLEMENT FIXATION TEST

The complement fixation test for gonorrhea is an invaluable aid in all stages of the management of gonorrheal cases.

In 1933 Price introduced a new antigen and improved the technic by using more concentrated serum. As the result of his work the sensitivity of the test is much improved and its value as a criterion of cure is enhanced.

False positives by "cross-fixation" for practical purposes do not occur and we find that a positive reaction in the serum of a patient who has not been treated with gonococcus vaccine is an absolute indication of a persistent focus of infection with the gonococcus.

In a series of cases treated with gonococcus vaccine it was my experience that when cure could be established the complement fixation test became negative within six weeks of the cessation of vaccine administration. A positive result after this interval invariably indicated residual infection.

On the other hand a negative serum result to the complement fixation test, even in the symptomless patient, can never be accepted as reliable evidence of cure or anything more than a sign of good progress and efficient drainage. In many cases we are able to demonstrate the gonococcus in the secretions long after the test has become and has remained negative.

Some variation in the strength of the fixation test is to be expected in the period that precedes cure, and no single negative reaction should be regarded as conclusive serologic evidence. It is our custom to perform the test at the beginning and at the end of our period of observation and testing. It is a common experience that, when treatment is prematurely discontinued and the patient remains under observation, the fixation test will again become positive, thus indicating a persistent focus of infection.

A provocative diet including alcohol is of assistance in the final stages. I have had no satisfactory results from provocative injections of vaccine or from provocative urethral instillations.

SUMMARY

1. No investigation as to cure need be undertaken in the gonorrheal patient who has a persistent urethral discharge or whose urine shows evidence of infection. To this main principle there may rarely be exceptions.

2. Palpation of the prostate is seldom of much assistance in the treated case. Palpation of the seminal vesicles is likely to give some positive information, but this is of little value when vesiculitis has been recognized and treated.

3. The macroscopic examination of the vesicular fluid and the microscopic examination of the vesicular and prostatic fluids are of great importance. Unsatisfactory microscopic tests are strong evidence against cure.

4. Vesiculoprostatic culture by Price's method constitutes an important advance in accurate diagnosis. The test repeated at monthly intervals over a period of time constitutes the absolute criterion of cure when all other tests have proved satisfactory.

5. Recent improvements in the complement fixation test for gonorrhea have increased its sensitivity and enhanced its value in testing for cure.

6. A positive serum result in a patient who has not received injections of gonococcus vaccine within the preceding six weeks is reliable evidence against cure.

7. Negative blood serum results on successive occasions in the course of treatment are evidence of efficient treatment but not necessarily of cure.

8. A provocative diet, including alcohol, is sometimes of value as a preliminary to the final series of tests and should be employed.

CONCLUSION

Let me review the evidence against cure in a clinically well patient. A negative complement fixation test may merely mean efficient drainage; it can and does occur when even smears are positive. What is the meaning of repeated positive cultures? I feel that while striving for accurate and infallible criteria of cure, we have arrived at the unenviable position of having apparently proved that cure is very much more difficult of achievement than is generally realized.

Further, it appears that the clinically well patient, having established a biologic equilibrium with his gonococci, retains the power of transmitting virulent infection to his sexual partner. Despite the work, time and thought given by us to this subject, I do not feel that we have arrived at conclusions which warrant more definite formulation. I do feel, however, that we have been able to establish the fallacies of previously accepted standards of cure. This paper is presented as an account of the work of the Whitechapel Clinic up to the present, so as to set forth our observations and difficulties and in the hope of enlisting cooperation and help in the work that lies ahead in the attack on the bristling problems of this ancient social menace.

ABSTRACT OF DISCUSSION

DR. MILEY B. WESSON, San Francisco: There is an aphorism in common use to the effect that "gonorrhea is no worse than a bad cold," and now our guest of honor tells us that gonorrhea is practically never cured. Somewhere in between these two extremes lies the truth. Theoretically, a man who has never had a genito-urinary tract infection should not have palpable seminal vesicles. Practically, it is almost impossible to find a microscopic section of the prostate of an adult that does not show evidence of inflammation. A number of years ago, Dr. Hugh H. Young wanted a set of normal sections of the genito-urinary tract. Eventually in order to get a normal prostate section to complete the set he used that of a new-born baby. Most of the men who have contracted gonorrhea marry sooner or later. If the disease were not primarily self limiting in type, a large proportion of marriages would be of the sterile or one-child type. In some states men are required by law and in others by their innate sense of decency to consult physicians when they desire to marry. The prostate gland and seminal vesicles are common sites of focal infections and from that standpoint are comparable in all ways to the tonsils or the gallbladder. Pus in the seminal vesicle does not mean that the man has had gonorrhea, although for fear that he did have it and that the gonococcus has been replaced by secondary invaders, I insist that he have the infection cleared up to protect not only his wife from a leukorrhea but himself from low backache secondary to arthritis or myofascitis. The cultural tests that Mr. King describes are intriguing. However, the strains of gonococcus prevalent in the United States will not grow on ordinary mediums but require special mediums and a decreased oxygen tension. Furthermore, there is no evidence that these are not atypical staphylococcus. Before an organism can be positively identified as the gonococcus it must be intracellular. The oxidase reaction would be valuable if a method of incorporating the dye in the medium could be worked out as suggested by Gordon and McLeod. Of course, the fact that it is not specific for any organism since Bacillus pyocyaneus, B. subtilis, Micrococcus catarrhalis, M. flavus and the neisserian group react to it impairs its efficiency. Orpwood Price reports that his antigen will give a complement fixation test that is as accurate as the Wassermann reaction. If this is so, a big advancement in the study of this disease will be made, when the test comes in general use. Vaccine treatment has not proved satisfactory in most clinics, and I believe there is far less used now than there was a few years ago. The gonococcus filtrate (Corbus-Ferry) is expected to give better results. I should like to ask Mr. King what his experiences have been with Diplococcus crassus. I have seen it in three patients, and the varied sizes of the gram-negative diplococci in the pus cells made a striking as well as confusing picture.

DR. JOSEPH A. HYAMS, New York: I feel that in most instances the persistence of a urethral discharge is due to complicating factors rather than to the gonococcus per se. Digital examination of the prostate with cultural and microscopic study of the expressed prostatovesicular secretion gives valuable information as to the persistence of an infectious process, but digital palpation of the seminal vesicles may be subject to erroneous interpretation, owing to the varying amount of supporting areolar tissue, and anatomic variations in the structure and relations of the seminal vesicles and ampulla of the vasa. In a study of a large series of casts of the seminal vesicles and ampulla, many showed extremely convoluted tubules. Their very tortuosity may serve to protect them from infection. It is questionable whether digital massage is adequate to express the secretion completely from these extremely tortuous vesicles. Infection of the seminal vesicles, particularly the walls, has not been noted with any degree of frequency cited by the author. In an exhaustive histopathologic and clinical study by Hyams, Kramer and McCarthy it was shown that infection of the seminal vesicles is far less frequent and not as severe as that of the verumontanum, ejaculatory ducts and prostate. A factor in the persistence of urethritis, in some instances, may be the continued infection of the submucosal glands of Alberran, located at the posterior vesicle lip and internal sphincter. As a result of extension of some of these glands into the muscular layer of the urethra, in the presence of repeated infection from the urethra, glandular adnexa, or descending infection from the upper urinary tract, various prefibrotic changes occur, ranging from early change to terminal fibrosis. In his study of a hundred cases, it would be interesting to know whether the infection was primary or secondary and the exact clinical status. Cultural and microscopic examination of the prostatovesicular secretion for the gonococcus is necessary for the determination of cure; the presence of clumped pus cells is important.

Complement fixation tests for the gonococcus have not proved satisfactory, particularly when negative. In addition to these procedures, the cause for persistence of infection can be best determined by the endo-urethral instruments of the McCarthy type. A clear demonstration of the urethra and vesical neck with or without water distention is essential for the localization and evaluation of the foci of infection. The criterion for the determination of the cure of gonorrhea, briefly, is the absence of the gonococcus.

DR. JOHN F. HOGAN, Baltimore: Some time ago I did some cultural work on the prostatic secretion, using hydrocele agar and testicular agar, and in many instances years after all clinical symptoms had subsided I found gonococci in cultures, in one man nineteen years later. I went into a very careful history with that man and he told me that he hadn't had any clinical symptoms of gonorrhea in the nineteen years. He came to me for relief of hypertrophy of the prostate. These organisms were morphologically and culturally gonococci. Of course the question comes up whether after all these years the organisms were virulent, that is, capable of producing the infection. That I don't know, but culturally and morphologically they were gonococci. I experienced no difficulty in differentiating Micrococcus catarrhalis and the gonococcus morphologically. Of course the meningococcus and the gonococcus look exactly alike morphologically, but I think all will admit that the urogenital tract would be a most unusual place to find meningococci.

MR. AMBROSE J. KING, London, England: I have been extremely interested in the comments, and I will take them in order. Dr. Wesson mentioned the question of sterility. I think he implied that if these persistent gonococcic infections are widespread, as I would have you believe, how is it that there are not more sterile marriages, more one-child marriages? We see a large number of sterility cases which we believe to be due to persistent gonococcic infection in the male and in which we find the gonococcus, but I think we see just as many cases in which the gonococcus is cultured in old standing infections, and yet the patient is married and has a family of children, although the wife is infected as well. As far as the complement fixation test is concerned, the claim that it is as useful in the diagnosis and treatment of gonorrhea as the Wassermann reaction is in the diagnosis and treatment of syphilis is not, in my opinion, an overstatement of its value. With regard to Diplococcus crassus, I know little or nothing about it. Of course, there are pseudogonococci described from time to time but I don't know that they enter into this discussion. Dr. Hyams said that a persistent urethral discharge was due usually to secondary infection, and one must agree with him. Yet in most of those cases an underlying gonococcic infection also is found. I was interested in his description of observations with the McCarthy panendoscope, and in what I saw in Dr. McCarthy's clinic the other day. I think this is a line on which more work may well be done in England. I think I have answered most of the points, and I hope to your satisfaction, and if I may be permitted a final comment it is that I have been impressed with the indifference in general of urologists toward the study of gonorrhea. The usual experience has been that the urologist has deputed the treatment of gonorrhea to his junior, or to his assistant, who with his eyes fixed on the goal of his surgical ambitions considered his association with the disease a necessary but rather repulsive stepping stone to higher things. I think that, as a result, insufficient work has been done in the past and is being done on improvements in methods of diagnosis and treatment of gonorrhea. The tendency in England at present is to make a special subject of the study of syphilis and gonorrhea, and the specialist in venereology, as we call it, spends all his time and gives all his attention to these diseases. I think that in this way we may go some distance to solve the very serious problem which is responsible for innumerable individual tragedies and for considerable economic loss to the state. I am grateful for this opportunity of putting my ideas before you, and I thank you for the honor of this invitation. I bring greetings from mutual friends in London, and the assurance that the great work which has been done and is still being done by American urologists is a constant source of stimulation and enthusiasm to those who are working in the same field in Great Britain.

EXPERIENCES WITH THE GONOCOCCUS FILTRATE (CORBUS-FERRY)

AND OTHER FORMS OF INTRADERMAL THERAPY IN THE TREATMENT OF GONORRHEA

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AND
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The origin of antibodies has long been and continues to be a subject of theory and speculation. It is likely, however, that antibody formation is a widespread cellular function with all the varied types of body cells participating to some degree. The literature abounds with controversy, and untold effort has been directed toward the solution of this problem.

It has been generally recognized for some time that the skin is not merely a protective sheath for the body but an organ of vital importance in the production of immunity; recently there has been increasing recognition of this function.[1] The rôle of the skin in immunity has been demonstrated largely by animal experimentation, but we think that in the future it will become a factor in the clinical concept of infection and resistance. Review of the literature reveals that the intradermal administration of specific and nonspecific antigens has been concerned chiefly with the diagnosis and treatment of allergic conditions and tuberculosis until applied in our own field of endeavor.

Müller [2] in 1922 called attention to the fact that in gonorrheal urethritis of the male a marked increase in urethral secretion could be produced within a few hours by subcutaneous injection of small quantities of nonspecific protein. Corbus and O'Conor,[3] inspired by the "antivirus" hypothesis of Besredka,[4] found gonococcus bouillon filtrates to be unsuitable for urethral treatment but capable of stimulating the production of antibodies when injected intradermally.

It is not our purpose to explain nor are we capable of explaining the rationale of the form of treatment advocated by Corbus [5] or to enlarge on his theories of immunity. We propose to relate our experiences of the past three years with the intradermal application of specific and nonspecific antigens in the treatment of gonorrhea.

Specific and nonspecific antigen therapy has occupied the attention of this assembly on various occasions. It is our impression that American urologists have largely given up the routine use of gonococcus vaccines, in spite of favorable reports that appear from time to time.

Read before the Section on Urology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Gay, F. P., in Jordan, E. O., and Falk, I. S.: The Newer Knowledge of Bacteriology and Immunology, Chicago, University of Chicago Press, 1929, p. 881. Ledingham, J. C. G.: The Rôle of the Reticulo-Endothelial System of Cutis in Experimental Vaccinia and Other Infections: Experiments with India Ink, Brit. J. Exper.-Path. **8:** 12 (Feb.) 1927. Kahn, R. L.: Studies on Sensitization: I. Skin Sensitivity and Serum Precipitin Response Following Intracutaneous Injections, Proc. Soc. Exper. Biol. & Med. **30:** 603 (Feb.) 1933; Studies on Tissue Reactions in Immunity: XI. Comparative Response Following Intravenous and Intradermal Injections of Organisms, J. Immunol. **25:** 339 (Oct.) 1933. Burt, K. L.; Tuttle, W. M., and Cannon, R. P.: Studies in Local Immunization of the Lungs of Rabbits with Pneumococcus Type I, Proc. Soc. Exper. Biol. & Med. **30:** 1138 (May) 1933.

2. Müller, E. F.: Leukopenia on Account of Nonspecific Injections Intracutaneously, München. med. Wchnschr. **69:** 1506 (Oct. 27) 1922.

3. Corbus, B. C., and O'Conor, V. J.: Intradermal Injections of Gonococcal Bouillon Filtrate: An Experimental Report, J. Urol. **24:** 333 (Sept.) 1930.

4. Besredka, Alexander: Local Immunization, Specific Dressing, Baltimore, Williams & Wilkins Company, 1927.

5. (*a*) Corbus and O'Conor.[3] (*b*) Corbus, B. C.: Intradermal Immunization in Genito-Urinary Diseases, J. Urol. **26:**727 (Dec.) 1931. (*c*) Intradermal Immunization in Gonorrhea: An Experimental and Clinical Report, J. A. M. A. **98:** 532 (Feb. 13) 1932.

The only convincing evidence that we ever have obtained as to the efficacy of gonococcus vaccine is embodied in the personally expressed opinions of surgeons of the British medical corps during the Great War, who were certain that routine use of vaccine in all cases of gonorrhea in the British army reduced complications, especially epididymitis, to a negligible minimum. Manufacturers do a large business in gonococcus vaccine, however, finding a continuous market for this commodity, in contrast to the vaccines for influenza and other more or less seasonal diseases. This indicates a persistent reliance on vaccines by the general practitioner, who cannot, like the specialist, gain impressions from large series of controlled cases. We believe that, if stock vaccines are used, the dosage should be very small and that the practice of giving large doses may account for many unfavorable results. Intradermal administration of stock gonococcus vaccines in the treatment of urethritis has in our hands accomplished nothing. To improve our knowledge of vaccine therapy we are considering the preparation of a large series of autogenous antigens by a method similar to that of Burbank [6] in other infections. We are also attempting to evaluate the gonococcus complement fixation test as a control measure for further immunologic studies on gonorrhea.

In addition to gonococcus vaccines we have used certain other preparations intradermally in the treatment of gonorrhea and gonorrheal complications. Of these, which include gonococcus filtrate (Corbus-Ferry) gonococcus immunogens, sterile milk, a commercial "solution of lactalbumin" and sterile bouillon, only gonococcus filtrate has warranted prolonged consideration.

The solution of lactalbumin that we formerly used extensively by the intradermal method advocated by Müller [2] gave fairly effective but not uniform results and we concluded that the intracutaneous administration was superior to intramuscular injection of large doses. Sterile bouillon identical with that used in the preparation of the specific filtrate, given intradermally, resulted in a mild but definite systemic reaction without the specific local and urethral reaction observed after the gonococcus filtrate.

Gonococcus filtrate (Corbus-Ferry) is classed as a soluble toxin [7] and is not to be confused with vaccines (bacterial suspensions), immunogens (bacterial washings), toxoids (solution of formaldehyde detoxified toxin) or serums (antitoxins). Whereas vaccines cannot be test-controlled, gonococcus filtrate can be standardized by skin test reactions in susceptible individuals and is adaptable for routine therapeutic use.

Our early studies were complicated by unstable and inactive lots of filtrate unwittingly furnished us. This fact goes far to explain adverse results reported by some of our colleagues who are unfavorable to the gonococcus filtrate.[8] We promptly discovered in the light of previous experiences that concentrated gonococcus filtrate as well as certain other experimental lots did not give the expected local reactions or favorable progress in the disease. We have since relied on the active and stable material originally supplied. It is interesting that our best results have been obtained with filtrate stored at room temperature in contrast to the same material stored at icebox temperature. We have been informed [9] that the factors causing the deterioration have been eliminated and our own experience with later lots has verified this claim conclusively.

Gonococcus filtrate (Corbus-Ferry) has been used by us for a period of more than two and one-half years. We are presenting the records of 124 cases, in more than 100 of which injections were given as the sole treatment of the gonorrheal infection or as an adjunct to the usual therapy. Records are included of some patients to whom injections were given as a possible means of provoking renewed discharge to furnish material for smears and cultures. In addition, we shall discuss cases suspected of presenting gonorrhea in which the filtrate was administered as an aid in diagnosis.

One hundred and one of these patients were men, nineteen were women and four were girls. Of the entire series, only twenty-one patients were seen promptly after the appearance of a urethral discharge, and of these fourteen made up the clinic group. Four patients had a urethral discharge for from eight months to two years prior to coming under our care. Thirty-six patients related episodes of previous gonorrheal infection.

Certain advanced conditions or complications at the time the treatment was begun are important. Of the entire series, four had epididymitis, and active involvement of prostate and seminal vesicles. Two had balanitis, two acute gonorrheal arthritis, one a jaw involvement, and twenty-one active disease of the prostate and seminal vesicles. In two cases there was epididymitis present, without evidence of adnexal disease; in both cases there was rapid improvement.

One hundred and ten of this series were private patients and the remaining fourteen were treated in a small well controlled clinic by one of us (R. A. B.). We have considered it necessary to see our private patients frequently and regularly and, in addition to weekly injections of the filtrate, use a mild local therapy for anteriorly limited diseases and our routine treatment in instances of posterior involvement with adnexitis. Women were also treated locally and children received simple washes administered at home in addition to specific therapy.

The clinic group was treated successfully with only weekly injection of gonococcus filtrate, but in our opinion such a regimen is not compatible with private practice. The clinic patients were selected from a group presenting themselves promptly on the appearance of a urethral discharge; all were males, and all reported regularly, adhering strictly to advice pertaining to general living habits. The infection in this small group remained confined to the anterior urethra in all cases, and there were no complications or recurrences; other patients under recognized treatment at the same time and in the same clinic did not show equal progress.

We have been impressed by the fact that local reactions to gonococcus filtrate vary not only with the stage of infection but with the type of individual, two points being important enough to report because of sufficient repetitions during our long period of observation. One is that the general condition of the patient is related to his reaction; if he is robust, the reaction is less severe, although his infection may be most resistant; if feeble or "run down," the reaction is likely to be more severe. The other point relates to the color of the skin; the

6. Burbank, Reginald: The Etiology and Treatment of Chronic Arthritis, J. A. M. A. **99**: 1489 (Oct. 29) 1932.

7. Clark, L. T.; Ferry, N. S., and Steele, A. H.: Studies of the Properties of a Bouillon Filtrate of the Gonococcus, J. Immunol. **21**: 233 (Sept.) 1931.

8. Personal communications and discussions.

9. Ferry, N. S.: Personal communication to the authors.

blond individual shows a more intense reaction to a given dose.

We grade the local skin reaction according to the degree of persistence of the skin wheal, which may remain as an intense red and slightly elevated area at the site of injection, and especially according to the extent of the reddened area surrounding the wheal. For convenience the reaction is recorded as "one-plus" if the redness is 1 inch (2.5 cm.) in diameter including the wheal, "two-plus" if the extension is 2 inches (5 cm.), and so on, "four-plus" meaning a 4 inch (10 cm.) extension or more. Other than this, we have noted repeatedly a very definite inguinal adenitis on the side corresponding to the site of injection. Most of the latter are given in the thigh, so that the distribution advocated [5e] can be readily followed out, and also because injections in the arm are more likely to attract attention. This adenitis occurs only with a strongly positive reaction. We have seen only an occasional truly systemic reaction to gonococcus filtrate. We interpret a prompt fading of the wheal, lack of local soreness and lack of surrounding redness as a negative reaction.

Dosage of the earlier stock preparations ranged from 0.1 cc. (2/20) to 1 cc., while the dosage of the aforementioned concentrated and unstable experimental lots was variable, depending on the degree of deterioration of the active principle. Our dosage range with the present stable and active preparation, as we now administer it, is from 0.1 cc. (2/20) to 0.3 cc. (6/20), and we have found no occasion to give larger doses as yet.

It has not seemed important to us to gage the dose of gonococcus filtrate or the frequency of injection by the stage of the disease, by the intensity of symptoms or by the amount of urethral discharge. We have not practiced nor do we advocate Corbus's instructions [5e] of withholding injections until two weeks after the onset of the urethral discharge. Even though the immunity acquired by means of gonococcus filtrate (if such develops) is active, we can see no logic in withholding specific antigen therapy designed to foster such immunity. It has been our practice to administer gonococcus filtrate as soon as the diagnosis is established, and in some instances the discharge has ceased by the time of the second injection.

We have not seen the intensification of purely local symptoms described by Corbus,[5e] namely, increased urethral tenderness, swelling and inability to void, with more urethral pus. In contrast to this we have seen acute balanitis, with extreme swelling of the glans penis and local urethral bleeding, respond overnight to an injection of gonococcus filtrate. On the other hand, occasionally a patient who is making excellent progress will suddenly pass into a phase with quickly increasing symptoms and possible extension of the disease to the point, for instance, of fulminating adnexitis, proving most recalcitrant to all treatment. We have been forced to conclude, therefore, that in some instances we supply the individual with excessive antigen. Yet, in a most severe case of urethritis, vaginitis and cervicitis, with vulval swelling and strangury, the response was phenomenal and organisms were never found after the time of first examination. So, therefore, we are in the habit of starting the injections of gonococcus filtrate as soon as the diagnosis of gonococcic infection is properly established. Also we continue its use for a period, even if organisms do disappear, although usually the repeatedly negative smear is our signal for interrupting the specific treatment.

The number of injections of gonococcus filtrate ranged usually from seven to ten. One patient was given seventeen injections, and one thirteen. The average number of injections for private patients was 5.3, and for clinic patients 7.

The period of time in which organisms were found roughly corresponds to the time of active urethral discharge. This varied in the group of private patients from one day to sixteen weeks and, disregarding one or two instances in which organisms were found only once, averaged five weeks. In the clinic group the range was from three to seven weeks, with the average likewise five weeks.

Gonorrheal vaginitis of the children included in this series showed a phenomenal response to gonococcus filtrate. We hope to continue our studies and endeavor to bear out these favorable impressions. Complete cessation of vaginal discharge occurred within from one to ten weeks. In passing, we should state that the dosage of gonococcus filtrate was lessened according to the age of the child in each instance.

Twenty-two men are still under treatment for adnexitis and eight women for cervicitis. The four little girls are under inspection for any possible return of the specific vaginitis.

We state boldly that except for stubborn adnexal involvement in the male, which is really an extension and not a complication, we have seen no complications and fewer recurrent infections after gonococcus filtrate. Naturally we believe this is partially circumstantial and that complications will occur in cases treated with this or any other preparation. In our opinion gonococcus filtrate is a means of reducing the number of complications as well as attaining a safer postinfection period for victims of gonorrheal infection.

REPORT OF CASES

The following abstracts serve to illustrate our text:

CASE 1.—C. (clinic), a man, aged 24, admitted, Feb. 21, 1933, was exposed seven days previous to examination. Dysuria started on the fifth day and a urethral discharge on the sixth day. Examination showed a profuse urethral discharge. A smear was positive for gonococci. The first injection was 0.5 cc. of gonococcus filtrate. There was a four plus reaction with increased urethral discharge and adenitis. The patient was given five weekly injections ranging from 0.5 to 1 cc. There was no discharge after the fourth injection and no reaction to the fifth dose. There were no complications. The prostate was normal. The second glass of urine remained clear. The patient was examined two months after the last injection of gonococcus filtrate; all examinations were negative and there was a negative reaction to 0.5 cc. of gonococcus filtrate (provocative).

CASE 2.—S., a man, aged 20, admitted to the hospital, Sept. 8, 1933, had had acute urethritis three and one-half months previously, with a discharge. The diagnosis was urethritis and acute parotitis. He was given stock gonococcus vaccine. There were no irrigations or injections. The discharge was thin and watery at this time but has never ceased. A sudden rise of temperature to 104 F., with swelling of the right mandible and parotid region, was followed by swelling of other joints but no redness or inflammation. A consultation with us, September 19, resulted in a diagnosis of arthritis of the right maxillomandibular joint. Examination was positive for urethritis and vesiculitis. Vas puncture and gonococcus filtrate were advised. Vas puncture was done, September 20, relieving the arthritis. Gonococcus filtrate was started with a 0.5 cc. dose. There was a moderate reaction with increased purulent urethral discharge. Urethral injections were started. There was only a "morning drop" after five days. The second dose, 0.75 cc. of gonococcus filtrate, gave a severe reaction and more

discharge for two days. He left the hospital, September 28. Daily office visits followed with irrigations and massage of the prostate, which was very large, soft and boggy, with four plus pus in the secretion. This routine treatment was continued with weekly injections of gonococcus filtrate, of which he had nine doses, with only a mild return of the discharge after the first five injections. The arthritis subsided entirely after the first two injections. No residual disease was seen in the joints. He was last examined, May 10, 1934. There was a mild residual prostatitis present.

CASE 3.—Miss J., aged 28, admitted, Sept. 20, 1933, had a profuse vaginal discharge and frequency of urination. She had been unexpectedly and unintentionally intoxicated ten days previously, with forced coitus. She had been uncomfortable ever since. She noted the discharge only the last five days. Examination showed pus from the urethra and Skene's ducts, and very angry vaginitis. The cervix was ulcerated, with a gross purulent discharge. A stained smear was positive for gonococci; the urethra and vagina were involved. The patient was given 0.3 cc. of gonococcus filtrate. Mercurochrome was applied to the cervix and urethra. She was given five weekly injections of gonococcus filtrate, ranging from 0.3 to 0.5 cc. No positive smear could be obtained after the first injection of filtrate. After the first week she was treated vaginally twice a week and with gonococcus filtrate once a week; late provocative filtrate injections were negative.

CASE 4.—P., a man, aged 40, admitted, Feb. 8, 1934, complained of a chronic urethral discharge, pyuria, frequency and nocturia. He had had an acute gonorrheal infection in October 1933. The discharge started seven days after exposure and he was treated elsewhere immediately. An "acid drug, and hypodermics" were given daily, then on alternate days. He did not improve, so he changed his physician in November. He was given nineteen treatments with mild silver protein. He complained of severe rectal pain and frequency requiring opiates. He went to a third physician with a "sore rectum and backache"; he was given liquid petrolatum and urinary sedatives, which relieved the condition somewhat. Three days before he saw us, the discharge began again; he saw his physician, who gave him a different drug, causing extreme swelling of the penis, which was present when he consulted us. On examination, a smear showed many pus cells, a few intracellular diplococci and many extracellular diplococci. He was given 0.3 cc. of gonococcus filtrate, which made him very uncomfortable and gave a four plus local reaction but resulted in a reduction of edema and no discharge on the following day. The second day the temperature was 102 F., the edema was gone and the prostate was swollen and tender. He was given four weekly doses of gonococcus filtrate, ranging from 0.2 to 0.3 cc.; there was no later discharge or edema. After three weeks the prostate was small, but the secretion showed three plus pus. The fourth week the prostate was small and fibrosed and the secretion showed pus two plus. There was no reaction to gonococcus filtrate, April 1, 1934, and only an occasional pus cell in the prostatic secretion.

CASE 5.—G., a man, aged 34, admitted, Feb. 10, 1934, complained of frequency, dysuria, rectal pain and a discharge. He had a history of gonorrheal infection in November 1933, with frequency and burning on urination since. In December 1933 he had severe rectal pain lasting several days. One week previous to admission a smear was found to be positive; he was given an injection (elsewhere). Thirty hours later he had a severe chill, fever and sweats; these recurred for several days, with a temperature up to 102 F. Associated was a return of the rectal pain for the past five days and a discharge for the past week. There was frequency to every half hour. He was given 0.2 cc. of gonococcus filtrate; the reaction was three plus, with less discharge the following day and only mucoid discharge on the third day. The prostate was tender and firm. The fourth day the prostate was small but the entire rectum was tender. The fifth day very acute prostatitis was present bordering on abscess. He was hospitalized. The fever subsided and the prostate improved. There was no discharge. On the ninth day he was given 0.2 cc. of gonococcus filtrate, with a mild local reaction. The prostate was much improved and he was discharged from the hospital. He was given three more weekly doses of 0.3 cc. of gonococcus filtrate. There was no discharge and local reaction. The prostate secretion was two plus before the last injection of gonococcus filtrate and four plus following it. He was still being treated for mild prostatitis, May 1, 1934.

CASE 6.—B., a man, aged 31, admitted, Jan. 5, 1934, had had a gonorrheal infection eight years before, with mild stricture and prostatitis. An acute gonorrheal infection, Oct. 19, 1933, was treated by a physician with daily injections of 2 per cent strong silver protein until Jan. 2, 1934, then with neosilvol. A smear, January 2, was reported negative. The patient was referred to our office. A very moderate urethral discharge was found. It was positive, with intracellular gram-negative diplococci. The prostate was large, hard and fixed, with definite fibrosis. Seminal vesicles fibrosed at the bases. Pus was four plus. He was given 0.2 cc. of gonococcus filtrate, followed by a severe reaction with adenitis and a profuse discharge; the condition has continued with a discharge, decreasing weekly, followed by increase and severe reaction after each injection of gonococcus filtrate. The patient has had thirteen injections in a dosage of from 0.2 to 0.3 cc., with routine treatment, massage and dilation of the urethra. Owing to continued urethritis, four endoscopies have been done, with 10 per cent silver nitrate solution applied directly to the ulcerated areas in the posterior urethra. The patient is still under treatment. The prostatic smear is positive. Diathermy to the prostate has improved the condition so that cure was apparent at the examination, June 1. This case has been resistant to gonococcus filtrate treatment and the record is given to indicate occasional failure of this additional aid in treatment.

CASE 7.—C., a man, aged 32, admitted, Feb. 8, 1934, was exposed nine days previous to examination. There was no dysuria or frequency. Five days after exposure, after drinking to excess, he passed bloody urine; four days later he noted a white discharge; a smear showed many pus cells and gram-negative intracellular diplococci. He had had a gonorrheal infection in 1917 and in 1918. In his first treatment with us he was given 0.2 cc. of gonococcus filtrate; the reaction was four plus; in four days the discharge disappeared. At this time he was given 0.2 cc. of gonococcus filtrate, with no local or general reaction. Seven days later 0.3 cc. of gonococcus filtrate was given, with no reaction, discharge or organisms. He was treated by massage and washes. Six weeks after onset, after missing some treatments, he had a "morning drop"; repeated smears were negative. He was having regular coitus and was drinking. The prostatic secretion was one plus pus and the smear was negative. Eight weeks later he noted that the meatus was sealed. He was given 0.2 cc. of gonococcus filtrate as a provocative test, which gave a severe three plus reaction and a positive smear. The discharge disappeared in two days. The prostate responded further under treatment and no organisms could be found. One week later he was given 0.2 cc. of gonococcus filtrate, with a three plus reaction. June 1, the prostate was normal but the patient is still under observation. Gonococcus filtrate injection on this date gave a negative reaction.

CASE 8.—F., a man, aged 28, admitted in November 1933, had a profuse chronic urethral discharge. A smear showed positive intracellular gram-negative diplococci. He had contracted gonorrhea from five to six years previously and had never been cured; he had chronic prostatic and seminal vesicular involvement. The present discharge started a few days before admission. He was given 0.2 cc. of gonococcus filtrate; it gave a four plus reaction, with right inguinal lymphadenitis; the discharge decreased after the fourth day. He was given six weekly doses of gonococcus filtrate, ranging from 0.2 to 0.4 cc. There was no discharge after the fourth dose except a profuse discharge for one day after the fifth injection. There was no reaction to the sixth injection. The patient returned four months later with an acute urethral discharge after a definite exposure. The smear was positive. He was given 0.1 cc. of gonococcus filtrate; the reaction was four plus, with adenitis. Twenty-four hours later there was very little discharge, and none after three days. The patient was still under observation, June 1. During this period routine treatment for posterior urethral involvement and adnexitis was given.

COMMENT

Early in our studies we were impressed with the possibilities of gonococcus filtrate as a provocative and diagnostic agent. We have used gonococcus filtrate in twenty-one cases as a diagnostic test or to provoke an increased specific urethral discharge as well as to locate dormant infections of the adnexa. We are not aware whether others have used gonococcus filtrate as a provocative agent. Our adoption of such a procedure has developed from the fact that a large part of our practice concerns patients who have been under treatment for varying periods elsewhere, coming to us in consultation or because of dissatisfaction. We felt that a relatively large dose (from 0.1 to 0.4 cc.) of gonococcus filtrate might activate dormant organisms for a short period, enabling one to make an accurate diagnosis; this supposition has been borne out occasionally. We have come to be fairly sure that the organisms are not present if the local reaction is negative and nonproductive of discharge or other returning symptoms.

In all twenty-one cases repeated smears were negative prior to the use of gonococcus filtrate, and the patients were free from gonorrheal infection as determined by the diagnostic measures ordinarily at our disposal. Six were known to have been infected with gonococci, others were suspected of having dormant gonococcic infections of the adnexa, and a few presented themselves for examination following known exposure. One man was under treatment for prostatitis; his reaction was strongly positive after a period of several months without organisms, and the latter appeared in a fresh urethral discharge and in the secretion from the adnexa. The injection in another case, eight months after known presence of organisms, gave no reaction. Likewise, an injection in one case two years after organisms had disappeared gave no reaction. In the other three cases, in which infection was known to have occurred, while organisms were found, the local skin reaction was positive; the increase of symptoms subsided with continued use of the filtrate and other appropriate treatment. In many sluggish cases the intradermal injections have caused a transient acute phase that is a powerful stimulus to the patient in the way of compelling more careful attention to instructions as to self care and faithfulness to treatment.

To control the use of gonococcus filtrate as a diagnostic provocative agent we have given injections to several individuals who were known never to have had gonorrhea; in none was there a positive diagnostic reaction or evidence of a urethral discharge. We have also administered, intradermally, plain bouillon identical to that used in the preparation of gonococcus filtrate, to patients both with and without known infection. Other than mild, definite systemic reactions attendant to such injections, we have observed nothing suggestive of the reactions just related.

SUMMARY AND CONCLUSIONS

Gonococcus filtrate (Corbus-Ferry) intradermally is the only antigen of the several we have tried that seems to offer a specific aid in the treatment of gonorrheal infection and complications. No attempt has been made to explain the rationale of intradermal medication or to establish the rôle of the skin in body immunity.

We have demonstrated that the filtrate can be used alone in the treatment of gonorrhea. It is our impression that gonococcus filtrate is most serviceable as an adjunct to mild local treatment. As pointed out, the filtrate is indicated in acute and chronic gonorrheal infections of men, women and children. It has been used freely in all types of complications and, in our opinion, has some virtue in amelioration, although other treatment, not so important in simple urethral involvement, is of prime necessity.

We have not followed the recommendation of Corbus [5e] but have used the filtrate freely in all stages of the infection and complications. We have departed from the recommended dosage scheme by giving not more than 0.1 cc. of filtrate (children should receive from 0.05 to 0.15 cc. of filtrate), increasing weekly by from 0.05 to 0.2 cc. (1/20-4/20), depending on the local skin, regional lymph gland, and systemic reactions as well as on the character of urethral discharge and the states of the infection.

Complications are today, as they have always been, of greatest importance in gonorrhea; late and unexpected transmission of the disease, sterility in both sexes, and the determination of safety in marriage are questions peculiarly in the domain of the consulting urologist. The determination of cure in gonorrhea has always been a difficult problem. We believe that our use of gonococcus filtrate in large doses (from 0.1 cc. to 0.4 cc.) as a diagnostic or provocative agent to demonstrate dormant infection is a milestone in progress toward the ultimate cure of obstinate gonorrhea.

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ABSTRACT OF DISCUSSION

DR. BUDD C. CORBUS, Chicago: Two years ago when I presented before this section a new method of treating gonorrheal infections in men, women and children, the experience of only a few collaborators was available. Since that time, however, more than a hundred urologists here and abroad have had an opportunity to use and evaluate this method. Last year the clinical experimental work was delayed because of the lack of potency of the filtrate. This has been corrected and there is available a bouillon filtrate the average minimum dose of which is only six twentieths of a cubic centimeter with a potency that is absolutely guaranteed. Whole gonococcus vaccine has long been recommended as an aid in the treatment of gonorrheal infections. If one takes the trouble to stain a given ampule, not a single whole gonococcus is visible; they have all autolyzed. However, a few favorable results have been reported when fresh preparations have been used. These were not used intradermally, however. The histiocytic elements in the skin are capable of being stimulated by both specific and nonspecific proteins. In the gonococcus bouillon filtrate there is a soluble specific toxin (protein) that is easily assimilated by the cytoplasm of the histiocytic cells, which in turn produce a specific antibody capable of influencing the infection in whatever part of the body it may localize. This specific antibody accumulation within the blood has been demonstrated time and again after a cure has been obtained by the complement fixation test for gonorrhea, whereas in the beginning of the infection, unless severe complications are present, the complement fixation test is invariably negative. The use of the bouillon filtrate as a diagnostic procedure is new to me. However, I can see that this method of producing a urethral discharge might be productive of positive results in making a diagnosis. The question has repeatedly been asked Will this gonococcus bouillon filtrate produce an immunity sufficiently capable of protecting an individual if exposed to infection? This experiment has never been tried, although I am anxious at some future date to see whether it is not possible to vaccinate an individual and later see if he can be inoculated with the gonococcus. When I first used the bouillon filtrate, too large a dose was often given and the reaction in the urethra was sometimes severe, causing tenesmus and inability to void. With the standardization of dosage as suggested by both Drs. Cumming, Burhans and myself, and with the filtrate that is available now, this complication should not occur. Biologic therapy is

precarious. Robust individuals react less severely to intradermal injections than those who are feeble or run down. However, in my experience, often a cadaverous looking individual builds his immunity faster than his robust neighbor. I have never noticed the susceptibility to blonds over brunettes. The idea of grading the size of the wheal as a guide to future dosage is admirable. Irrespective of the size of the wheal, I have not found it advantageous to continue the use of the toxin after the gonococcus has been absent from the urethra for two weeks.

DR. ROBERT E. CUMMING, Detroit: As Dr. Mathé of San Francisco was to have read a paper on this subject, I should like permission to quote two paragraphs from a letter recently received from him. "It is my opinion that filtrate is of great benefit in the treatment of acute gonorrhea, particularly if used shortly after the appearance of the discharge. If employed during the first five days after its appearance, it will often abort the disease. In those cases in which the disease is not aborted, it seems to lessen the occurrence of the usual complications, consisting of posterior urethritis, acute prostatitis with and without abscess formation, epididymitis, arthritis, pyelonephritis and cardiac disease. I have used the filtrate according to the dosage outlined by Corbus and Ferry. It has given splendid results in more than 100 acute cases, and I am very enthusiastic in its use. In chronic cases of prostatitis and seminal vesiculitis complicated by arthritis it also gives good results. The gonococcus bouillon filtrate of Corbus-Ferry constitutes a very active definite antigenic agent, and if those who feel that they care to use such an agent have found that this particular preparation has not been successful in their hands I believe it is solely because they have unwittingly received inactive preparations, which can be included among those lots I referred to in the text as being unstable and variable.

PRESENT STATUS OF TETANUS, WITH SPECIAL REGARD TO TREATMENT

REPORT OF FURTHER CASES FROM THE MASSACHUSETTS GENERAL HOSPITAL

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The prevention of tetanus has reached a substantially sound and reliable status, but the treatment in general is hardly more satisfactory than it was when Hippocrates handled the cases at the battle of Salamis, or when, centuries later, Frederick May advocated the use of infusions of tobacco by rectum. Our purpose in this paper is to add another series to the previously reported 116 cases from the Massachusetts General Hospital,[1] bringing the total to 149, and to deduce therefrom such conclusions as we may; also to review the current literature.

The modern conception of tetanus is that it is a disease caused by the toxin elaborated by the bacilli. The toxin circulates in the blood stream and is picked up by the motor nerve end plates and thence transmitted up the axis cylinders and perineural lymphatics till it reaches and becomes firmly fixed in the motor cells of the central nervous system, there causing irritative phenomena which result in tonic and clonic muscle contractions.[2] In the cases of general tetanus, or tetanus descendens (the more common form), the muscles with the shortest motor nerve trunks, the masseters, are first affected; then the muscles of the neck, thorax and back. This form predicates the circulation in the blood stream of a considerable amount of toxin. In that rare form local tetanus, or tetanus ascendens, the toxin is not to any marked degree present in the general circulation; rather it involves, at least at first, only the motor nerves to the affected part, resulting in irritation of the motor cells of the anterior horns of the cord, with subsequent local spasm, tonic or clonic. By the nature of the process it can be reasonably assumed that the local form will be less virulent and fulminating than the general type. The largest series of cases of local tetanus is that of the British army, reported by Sir David Bruce;[3] he found 201 local cases in a total of 1,458, a high percentage which was doubtless due to the universal use of prophylactic antitoxin in the army.[4]

That tetanus bacilli are frequently normal inhabitants of the intestinal tract of man, as well as of animals, is well known. Tenbroeck and Bauer[5] found B. tetani in the stools in twenty, or 34.7 per cent, of seventy-eight persons, and all twenty-six were found to contain appreciable amounts of tetanus antitoxin in the blood. This brings up the interesting suggestion, which they make, that such persons may have a potential immunity to tetanus; and such immunity may, to a degree, account for some of the very mild cases that one sees or, indeed, may furnish an absolute protection against this infection.

Since the previously mentioned phenomena of the distribution and later fixation of the tetanus toxin in the motor cells of the central nervous system are now appreciated, one is led at once to a consideration of the exact relation of the affected motor cells to the circulating fluid of the subarachnoid space, or cerebrospinal fluid, because it has been generally accepted that the introduction of the antitoxin into the subarachnoid space would doubtless afford a sound and scientific method of therapy. As a matter of fact, this assumption is without any theoretical support and with little clinical basis. The recent articles on this disease that have come to our attention have stressed the good or bad clinical results of the intraspinal use of the antitoxin, without analyzing the physiologic backgrounds.

The cerebrospinal fluid is elaborated largely by the choroid plexus, though there is evidence to show that possibly the perivascular spaces and ependymal cells lining the ventricles may produce a certain amount.

The absorption of (or fate of) the cerebrospinal fluid has been studied intensively by Weed and others.[6] Weed used a series of experimental animals, injecting into the subarachnoid space, at normal intraspinal pressure, a ferrocyanide-citrate mixture, immediately fol-

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1. The added thirty-three cases include four from our children's service, previously reported by H. L. Higgins and F. A. Harrison and now in press.

2. Ransom, F.: A Modern View of Tetanus, Lancet **2**: 928 (Dec. 22) 1917.

3. Bruce, David, quoted by Taylor: Local Tetanus, Case Report, Ann. Surg. **74**: 110 (July) 1921.

4. British Army-Manual of Injuries and Diseases of War, London, H. M. Stationery Office, 1918.

5. Tenbroeck, C., and Bauer, F. H.: Tetanus Bacilli as an Intestinal Saprophyte in Man, J. Exper. Med. **36**: 261 (Sept.) 1922.

6. Weed, L. H.: Studies on Cerebrospinal Fluid: II. The Theories of Drainage of Cerebrospinal Fluid with an Analysis of the Methods of Investigation. J. M. Research **26**: 21 (Sept.) 1914; III. The Pathways of Escape from the Subarachnoid Spaces with Particular Reference to the Arachnoid Villi, ibid. **26**: 51 (Sept.) 1914; IV. The Dual Source of Cerebrospinal Fluid, ibid. **26**: 93 (Sept.) 1914; The Cerebrospinal Fluid, Physiol. Rev. **2**: 171 (April) 1922; The Absorption of Cerebrospinal Fluid into the Venous System, Am. J. Anat. **31**: 191 (Jan.) 1923. Weed, L. H., and McKibben, P. S.: Pressure Changes in the Cerebrospinal Fluid Following Intravenous Injections of Solutions of Various Concentrations, Am. J. Physiol. **48**: 512 (May) 1919. Weed, L. H., and Hughson, W.: Systemic Effects of the Intravenous Injection of Solutions of Various Concentrations, with Especial Reference to the Cerebrospinal Fluid, ibid. **58**: 53 (Nov.) 1921; The Cerebrospinal Fluid in Relation to the Bony Encasement of the Central Nervous System as a Rigid Container, ibid. **58**: 85 (Nov.) 1921.

lowing this with introduction into the circulation of solution of formaldehyde, with enough hydrochloric acid to precipitate the ferric ferrocyanide (prussian blue granules), which were then studied both macroscopically and microscopically. According to Hughson[7] his results were, in brief, as follows:

> In the replacement experiments the precipitation of the prussian blue was wholly localized within the subarachnoid space, and the nervous tissue was absolutely free from coloration, these facts being shown both grossly and microscopically. There was also no penetration of the perivascular spaces. The granules, however, were traced directly into the arachnoidal villi, projecting into the basilar dural sinuses, particularly the cavernous sinuses. Furthermore, the granules could be seen passing through the mesothelial cells, capping the villus and through the endothelial cells of all the dural sinuses.

Weed said in part:

> It seems fair to assume that the absorption of the cerebrospinal fluid is a twofold process, being chiefly a rapid drainage into the great dural sinuses and in small part a slow indirect escape into the true lymphatic vessels.

In all this conclusive work there is nothing to suggest, even remotely, that the cerebrospinal fluid, or any foreign protein which it might contain, could possibly be brought into contact with, or penetrate, the motor nerve cells in the substance of the nervous tissue, the cells that contain the tetanus toxin.

The introduction into the blood stream of a foreign serum, or antitoxin, plus the simultaneous intravenous injection of a large amount of 0.45 per cent sodium chloride solution (a hypotonic solution just strong enough to avoid hemolysis), plus continuous lumbar drainage, produces a great increase in the formation of cerebrospinal fluid, or drainage of fluid from the blood into the subarachnoid space. This is called "forced drainage" and has been employed by Kubie[8] in the treatment of poliomyelitis, and by Fremont-Smith, Putnam and Cobb[9] in the treatment of multiple sclerosis. Kubie says:

> Forced drainage may be used either (*a*) alone or (*b*) as a vehicle for the intravenous administration of serum under optimal conditions for the transfer of antibodies from the blood stream to the central nervous system or (*c*) as a method of preparing the central nervous system for a subsequent subarachnoid injection of serum.

The use of intraspinal injection of antitoxin plus simultaneous intravenous hypertonic sodium chloride has been suggested. We have employed the intravenous administration of antitoxin plus lumbar drainage (not continuous) in one case of tetanus with no appreciable effect.

A vast amount of work has been done on this interesting subject, though not dealing directly with tetanus antitoxin, and the sum and substance of it all is that a foreign protein, such as antitoxin, introduced into the subarachnoid space, will be almost entirely discharged into the dural venous sinuses through the pacchionian granulations and a very small portion may be absorbed by the subarachnoid vessels; in neither instance is there the slightest reason to suppose that antitoxin, so introduced, can get directly into contact with or within the affected motor cells. On theoretical grounds therefore there is absolutely no basis for the intraspinal use of tetanus antitoxin, and clinical observations go far to support this thesis.

The comprehensive classification of tetanus, given by Courtois-Suffit and Giroux,[10] may be presented here to advantage.

1. Classic forms (descendens).
2. Abnormal forms:
   - A. Splanchnic (after abdominal operations).
   - B. Cephalic (wound of head):
     - (*w*) Nonparalytic.
     - (*x*) Paralytic (with facial paralysis).
     - (*y*) With oculomotor paralysis.
     - (*z*) With hypoglossal paralysis.
   - C. Unilateral.
   - D. Tetanus of limbs (local):
     - (*x*) Monoplegic.
     - (*y*) Paraplegic.
   - E. Abdominothoracic.
   - F. Attenuated form with long incubation.

The abnormal forms, particularly the local type, are most likely to develop in those cases in which a prophylactic injection of antitoxin has been given.

Numerous articles on tetanus may be found in the literature, and brief reference to some of these will here be made, under appropriate headings.

TYPES OF TETANUS

Tetanus Neonatorum.—This occurrence is not uncommon in China and the other countries of the East. Bratusch-Marrain[11] has seen twenty-six cases in Graz, especially in the older portions of the city; he recommends for treatment magnesium sulphate and chloral, as well as antitoxin both subcutaneously and intraspinally.

"Vaccination Tetanus."—Tetanus following vaccination against smallpox has always caused very serious concern among the medical profession, and it is interesting to note that in most cases the contaminating infection with B. tetani has apparently developed some days after the vaccination, as an accidental occurrence. This fact is stressed by Armstrong,[12] who collected ninety-eight cases from thirty-two states and the District of Columbia. He advises very small areas of vaccination ("insertions") and no subsequent covering pads. Klemmer and Crosland[13] found ten cases of postvaccination tetanus in ninety-six cases in Lancaster, Pa.

Tetanus Following Clean Operation.—Several years ago there was an outbreak in Madrid of about twelve cases of postoperative tetanus, thought to be due to contaminated suture material (catgut). The contamination through intestinal contents and spores on the skin has been studied by Meyer and Spector.[14]

Erdman[15] and Muller[16] each report such cases. We are indebted to Dr. William F. Dolan[17] for permission

7. Hughson, Walter: The Embryogenesis of the Human Cerebrospinal Fluid, The Human Cerebrospinal Fluid. Research Publication, New York, Paul B. Hoeber Inc., 1924, p. 7.
8. Retan, G. M., and Kubie, L. S.: Forced Drainage in the Treatment of Poliomyelitis, Bull. Neurol. Inst. New York **1**: 419 (Nov.) 1931.
9. Fremont-Smith, Frank, Putnam, T. J., and Cobb, Stanley: Forced Drainage of the Central Nervous System, Arch. Neurol. & Psychiat. **23**: 219 (Feb.) 1930.
10. Courtois-Suffit, Maurice, and Giroux, R.: Abnormal Forms of Tetanus, London, University of London Press, 1918.
11. Bratusch-Marrain, A.: Treatment of Tetanus of the New-Born, München. med. Wchnschr. **70**: 1485 (Dec. 14) 1923; Tetanus in the New-born, Arch. f. Kinderh. **74**: 45 (March 8) 1924.
12. Armstrong, Charles: Postvaccination Tetanus, J. A. M. A. **90**: 738 (March 10) 1928.
13. Klemmer, A. P., and Crosland, E. S.: The Treatment of Tetanus in the Hospitals of Lancaster, Pa., over a Period of Thirty Years, Am. J. M. Sc. **187**: 700 (May) 1934.
14. Meyer, K. A., and Spector, Bertha K.: The Incidence in the Stools and on the Regional Skin of One Hundred Urban Herniotomy Cases, Surg., Gynec. & Obst. **54**: 785 (May) 1932.
15. Erdman, Sevard: Tetanus Following Appendectomy, Ann. Surg. **97**: 934 (June) 1933.
16. Muller: Tetanus Following Herniotomy, Ann. Surg. **76**: 646 (Nov.) 1922.
17. Dolan, W. F.: Personal communication to the authors.

to refer to three cases, following clean operations, which were seen in consultation by one of us (R. H. M.) and several others. These cases were moderately severe, and all ended in recovery after adequate treatment. The exact source of the contamination was never determined, but it was thought to be the catgut.

TREATMENT

Hughson,[7] in 1924, gave the opinions of eleven different authors and the British Tetanus Committee on the use of antitoxin; all advised its use, with various adjuncts, but there was no unanimity of opinion in regard to the intrathecal route. Some were highly in favor of it, some equivocal, none definitely against it. Huntington,[18] whose splendid article every student of the subject should read, and Cooper[19] are lukewarm in their advocacy of antitoxin. Graves[20] recommends large doses but does not think that the intraspinal administration is of any especial value. Klemmer and Crosland[13] found a distinctly higher mortality in those having intraspinal antitoxin than those who did not. Wainwright,[21] in a masterly review of the subject, says: "Intraspinal injections are harmful, increase mortality, and should be abolished. Antitetanus serum is not useless. The efficiency . . . will depend directly on the promptness with which it is given. The best sedative is chlorbutanol (chloretone)." Higgins and Harrison,[1] who have already reported and discussed four of the cases (children) included in our series, advocate the employment of smaller doses of antitoxin, favor the use of tribrom-ethanol as a sedative, and say "It would seem then that, in giving tetanus antitoxin intraspinally, there is no added therapeutic value and may result in greater discomfort to the patient and perhaps some injury to the nervous tissue by increasing edema of the brain and spinal cord."

TABLE 1.—*Outcome with Regard to Portal of Entry*

Portal of Entry	Recoveries	Fatalities
Head	1	2
Trunk	1	2
Arm	1	3
Hand	5	1
Leg	2	3
Foot	4	4
Total	14	15

TABLE 2.—*Effect of Lenth of Incubation on Mortality in Thirty-Three Cases*

Incubation Period	Cases	Mortality
1. From 1 to 10 days	13	76.9%
2. Eleven days or more	17	23.5%
3. Unknown	3	33.3%

TETANUS AT THE MASSACHUSETTS GENERAL HOSPITAL

In a previous paper by one of us[22] there were recorded 116 cases of tetanus, seen at the Massachusetts General Hospital from 1872 to 1921, inclusive. The total mortality in the series was 69.9 per cent.

From 1900 to 1909 (inclusive) there were eighty-nine cases, with a mortality of 65.1 per cent; from 1910 to 1915 (inclusive) there were forty-five cases, with a mortality of 57.8 per cent; from 1916 to 1920 (inclusive) there were twenty-five cases, with a mortality of 52 per cent, and in 1921 there were five cases, with a mortality of 40 per cent. From 1922 to 1933 inclusive the diagnosis of tetanus was made thirty-three times at the Massachusetts General Hospital. Fifteen patients died and eighteen recovered, a mortality rate of 45.5 per cent for the whole group.

Diagnosis.—The diagnosis was obvious clinically in all but one case[23] in which there were also signs suggestive of meningitis. In only one case was the diagnosis confirmed by culture of the bacillus from the wound. Usually the portal of entry was healed by the time the patient came under observation. Autopsy was done in eight of the fifteen fatal cases.

Portal of Entry.—It was often extremely difficult to get a story of the injury from which the disease started. In four cases no portal of entry could be traced. These all happened to be cases which recovered. The location of the portal of entry in the remaining cases does not seem significant, with the possible exception of hand lesions, five recovering to only one dying.

TABLE 3.—*Abdominal Rigidity*

	Recoveries	Fatalities
Abdomen soft	1	3
Abdomen rigid	14 (3 "boardlike")	6 (1 "boardlike")

Symptoms.—The early symptoms were often rather vague and nondistinctive. General malaise, lame muscles of the back, headache, sore throat, facial asymmetry, and involuntary grimacing, for example, did not offer any clue to the true condition. These symptoms were rapidly followed, however, by discomfort in the jaws, inability to open the mouth, stiff neck, and finally convulsions. Although the incubation period in some cases had a duration of several days or weeks, once the symptoms appeared they developed in a few hours. There seemed to be no demonstrable relationship between the nature of the first symptoms and the severity of the disease.

Incubation Period.—Of course, in cases in which the portal of entry was not known the incubation period could not be determined, but table 2 shows the relationship between the prognosis and the incubation period where known.

Although the figures in table 2 serve to confirm further the already familiar generalization that a short incubation period tends to be a good omen, it is well to note that this is only a tendency and that, in this series, not every case with a short incubation period ended fatally, and not every case with a long one went on to recovery.

Abdominal Rigidity.—A sign that is not usually stressed in descriptions of tetanus was present a surprising number of times in this series. In nine of the thirty-three cases no note was made regarding the abdominal wall. Of the remaining twenty-four, how-

18. Huntington, R. W.: The Treatment of Tetanus, Yale J. Biol. & Med. **3**: 207 (Jan.) 1931.
19. Cooper, N. A.: Analysis of 102 Consecutive Cases of Tetanus, Lancet **2**: 930 (Dec. 22) 1917.
20. Graves, A. M.: Tetanus in New Orleans, Ann. Surg. **92**: 1075 (Dec.) 1930.
21. Wainwright, J. M.: Tetanus: Its Incidence and Treatment, Arch. Surg. **12**: 1062 (May) 1926.
22. Miller, R. H.: Tetanus, Report of 116 Cases at the Massachusetts General Hospital, Surg., Gynec. & Obst. **36**: 90 (Jan.) 1923.

23. The reader is referred to the appended case abstracts.

ever, twenty showed abdominal rigidity, referred to in four instances as "boardlike," and only four presented soft abdominal walls. This is mentioned here not because of any possible significance it may have in the course of the disease but to point out the danger of being misled into a diagnosis of some acute intra-abdominal lesion in a case of tetanus in which the other symptoms are not particularly striking. With regard to the possible significance of abdominal rigidity in tetanus, table 3 is suggestive, at least on first sight.

We are not prepared to draw any conclusions from this distribution of results, however, beyond the obvious one that among the fatal cases were many patients too sick to be thoroughly examined.

Temperature and Leukocytosis.—Among the patients who recovered, the temperature rarely was higher than 103 or lower than 101, and the average temperature was 102.8 F. The average white blood cell count for this group was 12,500, five patients having white blood cell counts below 10,000, and one as low as 4,000.

The fatal cases usually presented a much higher temperature, which as a terminal event often went above 105 and in two instances as high as 108, the average being 105.6. The white blood cell count, however, did not show a commensurate increase, the average being only 18,500. Not one was below 15,000, however, in the group of fatal cases.

Clinical Course.—The classic course of the disease has often been described and will not be repeated here, but a few significant figures will be mentioned. The average time from onset to death in the fatal cases was three days. In only one fatal case did the patient live as long as ten days, and eight patients (54 per cent) died within two days of onset.

In marked contrast is the average duration of 3.2 weeks from onset to recovery in the nonfatal cases. The longest time was six weeks and the shortest two weeks.

TREATMENT

It will not be possible to record all the details of treatment. Typical methods used will be described and the subject discussed in a general way.

Sedatives.—Many of these patients were already having convulsions on admission to the hospital, so that the most urgent problem was that of sedatives. A typical picture is as follows (case 25): "He lies still and half asleep, but on any sensory stimulus becomes cyanotic, with neck hyperextended, jaws set, spasm of the whole body, and loss of sphincter control." Another typical picture is from case 27: "Lies quietly in bed until someone enters room, when suddenly has severe spasm with marked risus sardonicus and great apparent pain. Subsides immediately, but this is repeated at each noise or movement of visitors." Still another is from case 22: "In emergency ward he went into opisthotonos, was covered with sweat, and was apparently suffering indescribable agonies."

The agents most often used were phenobarbital, 10 grains (0.6 Gm.) by rectum or 3 grains (0.2 Gm.) by mouth; morphine, ¼ grain (0.016 Gm.) subcutaneously; chloral, 30 grains (2 Gm.); paraldehyde, 5 cc.; sodium amytal, 12 grains (0.8 Gm.), and tribromethanol, from 80 to 100 mg. per kilogram of body weight. Two patients were given repeated primary ether anesthesia to control extreme spasms. Large amounts of sedatives were sometimes needed. Patient 21, a man, aged 45, who made a complete recovery, was given chloral, 75 grains (5 Gm.); morphine, ¾ grain (0.05 Gm.); phenobarbital, 7½ grains (0.5 Gm.), and paraldehyde 20 cc., all in the space of thirty-six hours. Tracheotomy was done three times in the vain hope of making respiration easier.

Antitetanus Serum.—Only one of the patients (case 12) in this series had received prophylactic antitetanus serum before admission to the hospital. As soon as the diagnosis was made, every patient was given large doses. In most instances the serum was administered by several routes. Two patients had intramuscular injections alone, and five had only intravenous injections. Four patients had serum injected into the tissues at the suspected portal of entry in addition to some other method of administration. Eleven patients received intraspinal injections in addition to other routes. Six of these recovered and five died. The intravenous route was used the most often (thirty cases), intramuscular next (twenty cases), intraspinal next (eleven cases) and local least often (four cases). Table 4 shows how these different methods of administration were combined, and how the individual methods were divided between the fatal and nonfatal cases.

TABLE 4.—*Methods of Administration*

Method of Administration	Number of Recoveries	Number of Fatalities	Total
Intravenous alone	2	3	5
Intravenous and intramuscular	8	5	13
Intravenous and intraspinal	3	2	5
Intravenous and local	..	1	1
Intravenous, intramuscular and intraspinal	2	1	3
Intravenous, intramuscular and local	1	..	1
Intravenous, intraspinal and local	..	1	1
Intravenous, intramuscular, intraspinal and local	1	..	1
Intramuscular alone	1	1	2
Method unknown	..	1	1
Total number of cases	18	15	33
Distribution Between Fatal and Nonfatal Cases			
Intravenous with or without other methods	17	13	30
Intramuscular with or without other methods	13	7	20
Intraspinal with or without other methods	6	5	11
Local injection with other methods	2	2	4
Method unknown	..	2	2

So many other factors influence the outcome of each case that it would be futile to try to evaluate the different combinations of methods of administering serum from these tables. They do serve to show, however, that no one method stands out as greatly superior in results to the others, and that those patients treated without spinal injection did at least as well as those treated with it. There is no reason to infer that only the sickest patients were selected for intraspinal injections. On the contrary, one of the most serious practical objections to this method is its technical difficulty or impossibility in the presence of spastic hyperextension.

The largest amount of serum used in a single case was 310,000 units. The average amount in the fatal cases was 112,000 and in the nonfatal cases 160,000. The difference is merely a reflection of the shorter period of time during which the fatal cases were available for treatment.

Serum Reaction.—Patient 12 proved to be hypersensitive to horse serum on the routine skin test, and it

is interesting to note that this was the only patient who had received prophylactic antitetanus serum. During the process of desensitization on the first day he reacted by flushing and blanching, sweating, nausea, transitory uticaria, cyanosis and mild respiratory difficulty. After the first day large doses of serum were administered intravenously and intramuscularly without incident.

Ten other patients showed serum reactions of various kinds and degrees, making a gross incidence of 33⅓ per cent in the whole group. These reactions were of two distinct types. The first type consisted of symptoms immediately after an injection, varying from a transitory rise in pulse to an alarming degree of collapse. The other type consisted of urticarial rash coming on several days after a serum injection. Patient 15 demonstrated both types of reaction.

The important thing is that the dangerous anaphylactic phenomena, though occasionally suggestively shown in from three to five days after the initial injection, do not usually occur until after about ten days, or later. After the lapse of ten days from the institution of the serum treatment, further administration must be carried out with caution.

The serum sickness, characterized by such conditions as urticaria and joint symptoms, develops on an average of ten days after the first injection and can be controlled by subcutaneous injections of epinephrine.

COMMENT

The mortality in cases of tetanus at the Massachusetts General Hospital has decreased, though never below 40 per cent, which was the figure in five cases in 1921. From 1922 to 1933 inclusive the mortality rate (thirty-three cases) was 47 per cent. Undoubtedly the one factor that will further lower the death rate is the more universal use of prophylactic injections; this is a desideratun hard to achieve, however, because certain apparently very trivial wounds will prove later to be the source of the disease. All compound fractures, gunshot wounds, deep punctured wounds, "street" wounds and "farm" wounds should be treated prophylactically. Ordinary wounds acquired in the home, or in clean places, free from possible fecal contamination, or while bathing at the shore, should not require the injection. A dressing should never be applied to the "insertion" area of a smallpox vaccination.

The consideration of our cases, and a review of the opinions of many others, lead us to recommend early and large doses of tetanus antitoxin given by the intramuscular and intravenous routes, while we cannot recommend the further use of intraspinal injections. The use in tetanus of intravenous antitoxin by the "forced drainage" method, as employed by Kubie and by Fremont-Smith, Putnam and Cobb in poliomyelitis and multiple sclerosis, seems to us theoretically attractive but practically impossible.

SUMMARY AND CONCLUSIONS

1. Thirty-three additional cases of tetanus are reported from the Massachusetts General Hospital, making a total of 149 cases. Since 1896, when antitoxin was first used, the mortality has declined from 80 to less than 47 per cent.

2. Prophylactic injection of antitoxin (1,500 units) is indicated in cases of deep or puncture wounds that may be contaminated. In unusually suspicious cases this should be repeated once or even twice at intervals of ten days.

3. The wound should, when possible, be debrided and kept open.

4. After the onset of tetanus, every effort should be made to conserve the patient's strength by the maintenance of nutrition and fluid balance, and by the combating of muscle spasms.

5. Tribrom-ethanol is a useful drug for the control of spasms.

6. As soon as the diagnosis is made, serum should be given intravenously, intramuscularly or both in daily doses of from 20 to 80 thousand units up to a total of 300 thousand units.

7. In hypersensitive subjects the process of desensitization must be instituted as soon as possible.

8. There are no theoretical or practical grounds for the recommendation of the intraspinal administration of antitoxin.

9. Serum reactions may be expected in about one third of all cases treated. The immediate reactions are commonest from two to five days after the initial dose of serum, and the delayed reactions from the tenth to the fifteenth day. No fatal reactions were encountered in the present series.

ABSTRACT OF CASES

CASE 1.—Girl, aged 4. Smallpox vaccination. Onset of symptoms in twenty days; headache, pain in back of neck, convulsions. Died in convulsion with temperature 108. Total antitoxin, 40,500 units; intravenous 30,000, intramuscular 10,500.

CASE 2.—Man, aged 55. Cut thumb on bottle. Onset of symptoms in sixteen days. Had lame jaw, for which he went to dentist, and had convulsion on way to dentist's office. Later developed trismus, and spasm of neck and leg muscles Total antitoxin 340,000 units, intravenous and intramuscular. Recovered.

CASE 3.—Boy, aged 2 years and 10 months. Wound inside nose from foreign body. Onset of symptoms in probably six days. Died in convulsion. Total antitoxin 20,500 units.

CASE 4.—Man, aged 54. Wound of thumb while working around barn. Symptoms began in twelve days, with trismus. Developed convulsions. Total antitoxin 180,000 units. Recovered.

CASE 5.—Boy, aged 10. Blister on heal. Onset of symptoms doubtful, probably thirty days. Developed trismus, risus sardonicus, slight opisthotonos, frequent convulsions. Total antitoxin 126,500 units. Recovered.

CASE 6.—Boy, aged 6. Smallpox vaccination. Onset of symptoms in twenty-six days. First diagnosis poliomyelitis; later, with development of trismus and other signs, diagnosis changed to tetanus. Total antitoxin 70,000 units. Recovered.

CASE 7.—Boy, aged 9. Nail wound of foot. Developed symptoms in twelve days; trismus, lame back and shoulders, spasm of legs. Total antitoxin 180,000 units. Recovered.

CASE 8.—Man, aged 71. Skin lesions on hands attributed to a Puerto Rican parasite. Incubation period not known. Developed trismus, and B. tetani found in lesions. Total antitoxin 160,000 units. Recovered.

CASE 9.—Man, aged 52. Wound of hand from chicken wire. Onset of symptoms in twenty-one days. Developed trismus, spasm of neck muscles, opisthotonos and convulsions. Died in respiratory failure with temperature 106.5. Total antitoxin 310,000 units.

CASE 10.—Boy, aged 16. Lacerated wound of toe from horse stepping on it. Onset of symptoms in two and two-thirds months. Developed trismus, rigid neck and convulsions. Difficulty in breathing led to tracheotomy, which gave only temporary relief. Died in convulsions. Total antitoxin 240,000 units.

CASE 11.—Girl, aged 7. Lacerated wound of face. Onset of symptoms in six days. Developed trismus, spasm of neck

muscles, opisthotonos and died in convulsions. Total antitoxin 30,000 units.

CASE 12.—Man, aged 22. Shotgun wound causing compound fracture of femur. Given prophylactic antitoxin, 1,500 units. Local tetanus in twenty-one days, trismus in twenty-four days. Total antitoxin (following desensitization) 178,600 units. Recovered.

CASE 13.—Boy, aged 14. No history of trauma. Onset of symptoms with trismus, facial asymmetry, stiff back, and spasm of left leg and back. Total antitoxin 100,000 units. Recovered.

CASE 14.—Girl, aged 3. Superficial scratches. Onset of symptoms in forty-three days. Developed trismus and painful spasms of back and abdomen. Total antitoxin 40,000 units. Recovered.

CASE 15.—Man, aged 31. Lacerated wound of thumb. Onset of symptoms in five days. Developed trismus, painful spasm of all muscles, and opisthotonos. Total antitoxin 160,000 units. Recovered.

CASE 16.—Woman, aged 63. Dirty laceration of leg. Onset of symptoms in five days. Developed trismus, stiff neck, and generalized convulsions. Died in respiratory spasm. Total antitoxin 200,000 units.

CASE 17.—Girl, aged 4. Superficial dirty wound of face. Onset of symptoms in seventeen days. Developed trismus, stiff neck, and frequent generalized convulsions. Total antitoxin 200,000 units. Recovered.

CASE 18.—Boy, aged 6. "Thorn in foot" wound became septic. Also, smallpox vaccination one month later. Symptoms developed one month after vaccination (incubation period thus doubtful). Had trismus, general muscle spasm and opisthotonos. Total antitoxin 110,000 units. Recovered.

CASE 19.—Man, aged 36. Incision and drainage of septic hip joint. Onset of symptoms in twelve days. Chief sign was trismus. Total antitoxin 210,000 units. Recovered. This case suggests the possible introduction of B. tetani in catgut, at time of operation.

CASE 20.—Man, aged 67. Punctured wound of foot (nail). Onset of symptoms in sixteen days. Developed trismus, spasm of neck and leg muscles. Total antitoxin 113,000 units. Recovered.

CASE 21.—Man, aged 45. Excision of sarcoma of leg (aseptic operation with dressing of silver-foil). Onset of symptoms in five days. Developed trismus, spasm in neck, back and legs; extraordinary severe cramps in abdominal muscles. Total antitoxin 145,000 units. Recovered.

CASE 22.—Man, aged 36. Nail wound of foot. Onset of symptoms in ten days. Developed trismus, spasm of neck and back muscles, convulsions and opisthotonos. Total antitoxin 40,000 units. Died in convulsions shortly after admission.

CASE 23.—Man, aged 57. Nail wound of foot. Onset of symptoms in twelve days. Developed trismus, stiff neck, general muscular rigidity, and convulsions. Total antitoxin 61,500 units. Died in convulsions shortly after admission.

CASE 24.—Boy, aged 7. Leg crushed by automobile. Onset of symptoms in seven days. Developed trismus, general muscular rigidity, opisthotonos and convulsions. Total antitoxin 30,000 units. Died five hours after admission.

CASE 25.—Boy, aged 13. Bullet wound (0.22 caliber) of back. Onset of symptoms in nine days. Developed trismus, generalized muscular stiffness and convulsions. Total antitoxin 30,000 units. Died five hours after admission in acute spasm of respiratory muscles.

CASE 26.—Man, aged 56. Compound fracture of leg, street accident. Wound became septic. Onset of symptoms in fourteen days. Developed trismus, generalized muscular stiffness and convulsions. Total antitoxin 155,000 units. Died in convulsions.

CASE 27.—Boy, aged 10. Fourth of July accident to finger, with cap-pistol. Onset of symptoms in fifteen days. Symptoms were mild and subsided; on eighteenth day after injury went into opisthotonic spasm at home. Not brought to hospital till twenty-third day after injury, when he had trismus and convulsions. Striking improvement on day after institution of treatment. Total antitoxin 110,000 units. Recovered.

CASE 28.—Boy, aged 16. Compound fracture of ankle in street, treated at home. Onset of symptoms in six days. Developed trismus, spasm of neck and back muscles, convulsions, opisthotonos. Total antitoxin 170,000 units. Died in convulsions.

CASE 29.—Man, aged 56. Lacerated wound of elbow. Onset of symptoms in nine days. Developed trismus, stiffness of neck and back muscles, opisthotonos. Total antitoxin 300,000 units. Recovered.

CASE 30.—Girl, aged 6. Smallpox vaccination. Onset of symptoms in thirteen days. Developed trismus, generalized convulsions and opisthotonos. Total antitoxin 30,000 units. Died in convulsions few hours after admission.

CASE 31.—Boy, aged 16. Simple fracture of ankle, followed by open reduction in hospital. Patient worked in stable. Onset of symptoms in eighteen days. Developed trismus, generalized convulsions and opisthotonos. Total antitoxin 81,500 units. Recovered.

CASE 32.—Man, aged 32. Lacerated wound of wrist while working in orchard. Onset of symptoms in six days. Developed trismus, generalized convulsions, and opisthotonos. Total antitoxin 185,000 units. Died.

CASE 33.—Woman, aged 51. Kidney operation (nephrectomy). Onset of symptoms in nine days. Developed trismus and convulsions. Total antitoxin 80,000 units. Died in convulsions.

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ABSTRACT OF DISCUSSION

DR. FREDERIC W. TAYLOR, Indianapolis: As has been suggested, the local lesion must receive prime consideration. It, after all, initiates the entire tetanic syndrome. That this point has been frequently overlooked is borne out by a study of any series of tetanus cases. In a small series that I had occasion to review, seventeen patients were admitted to the hospital with healed skin lesions. These wounds were not touched, were not excised, were not explored, for fear of disseminating tetanus toxin in the body. The toll of this overcautious procedure was twelve lives, a mortality in excess of 70 per cent. In the last three years I have seen five autopsies on patients dying with tetanus. In three of these cases, foreign bodies were removed from the local wound at the autopsy table. These were bathed in pus containing Clostridium tetani and surrounded by the usual gray necrotic tissue. In order to prevent or minimize the danger of such accidents, I believe that all tetanus cases should be admitted to the hospital only by way of the operating room. Here the local wound should be excised if possible; if not, it should be thoroughly explored and a débridement done. I am glad to hear the authors voice their protest against intrathecal administration of antitoxic serum. I am quite in accord with this view and feel not only that it is an inefficient and ineffective route by which to administer this serum but that it does harm in giving the clinician a false sense of security as to just what that serum will do. I should like to take issue with the authors on the dosage of tetanus antitoxin. Given prophylactically, the serum is a specific without a peer in the biologicals. Used in the treatment of tetanus after the disease has once developed, it certainly is not a specific and should be considered as an adjunct to any other treatment. I believe that 50,000 units or at most 100,000 units is quite amply sufficient to neutralize toxin in the tissues and blood stream. I believe moreover that huge doses of tetanus antitoxin have done harm, not because they are useless, not because they cause serum sickness and not because of immediate anaphylactic reactions. Large doses of antitoxin have done harm in giving a false sense of security to the clinician. He therefore neglects the local lesions, passes over lightly deep relaxation of his patient, and pins his hope on the specific.

DR. RICHARD H. MILLER, Boston: I am glad that Dr. Taylor emphasized the local wound, because that is of great importance. We did not say very much about it. I know that some cases of tetanus are so mild the patient will get well anyway. Some cases are so virulent that nothing can be done for them, but there is a small group in between in which careful and effective treatment will save life.

RECTAL GONORRHEA IN WOMEN

CLEMENT L. MARTIN, M.D.
CHICAGO

Gonococcic infection of the rectum decidedly is not an uncommon complication in women who harbor this infection in the cervix or the urethra. Symptoms often are absent; nearly always they are mild. As a consequence the disorder rarely is diagnosed. Years ago Jullien [1] stated that rectal gonorrhea "is a disease one sees only if one looks for it." This statement is still pertinent. The lesion commonly results from genital gonorrhea. Although not uncommon, it is not very frequently encountered in the ordinary run of examinations in women in a proctologic practice. The disease is rather uncommon in males and rare as a primary ailment in women. Of 220 men having gonorrhea in the Chicago House of Correction Hospital, a group in which the incidence would be expected to be relatively high, De Bere [2] found rectal gonorrhea in a little over 2 per cent of the cases.

Although many women have rectal gonorrhea, the infection has not been given much attention in the United States. A survey of current textbooks on venereal diseases discloses that it is mentioned briefly if considered at all; in numerous standard treatises on gynecology it is not even mentioned; in one of the most recent its discussion is limited to three lines. Although scant attention has been given to the subject in English literature, a number of theses have appeared on various aspects of rectal gonorrhea in continental publications, especially during the last five years in the German.

Bruno Peiser [3] credits Hecker [4] with first describing the disease (1789). Hecker considered unorthodox intercourse the common cause. Foerster [5] (1860) called attention to "rectal catarrh," which he thought often was due to gonorrhea. After Neisser's discovery of the gonococcus (1879) there was more interest in the disease. The majority of the reports dealt with its frequency in women. In recent German literature there is general agreement that rectal gonorrhea is a common concomitant of female genital gonorrhea, that the incidence is high, that it is easily overlooked and that the gonococcus can retain its virulence in the rectum for more than a year. Bickel and Abraham [6] state that in fifteen cases, if histories as given by the patients are accepted as correct and reinfection is ruled out, "even after gonorrhea of the genitalia has remained cured for more than ten years, gonococci still may be found in the rectum."

Hayes [7] published the first paper in English to deal with the important rectal aspects of the disease, and Rosser,[8] in a paper on venereal disease of the anus and rectum, discussed the disease as seen in twenty-five of his cases. He states: "In the United States the disease has continued to be regarded as a rare and self-limited complication, requiring no attention except for a short period of palliation in those cases (the minority) in which unusually severe local reactions enforce it. . . . Adherence to the diagnostic criteria of Jullien [(c. 1886) i. e., the triad purulent discharge, broad anal ulcer and condyloma], has been responsible for the failure to recognize the condition as a very small percentage of these patients present rhagades, external ulcers and codylomata."

MODE OF INFECTION

In women, gonorrheal proctitis ordinarily is secondary to genital infection. The vaginal discharge containing pus from the urethra, cervix or Bartholin's gland contaminates the anus. The normal eversion of the anus during defecation readily brings the pus in contact with the terminal rectal mucosa and infection follows. Contamination at defecation is the usual means of infection.

Other means of infection mentioned by various observers are the wearing of tight undergarments; contamination of the anus with infected urine; the partial expulsion and subsequent retraction of the final portion of a fecal mass, especially in constipated women; the backflow of a vaginal douche; contaminated rectal or vaginal syringes, rectal speculums or dilators, and rectal thermometers; the insertion of a suppository with infected fingers; rupture of a gonorrheal, prostatic abscess; peno-anal coitus, and rectal disease which brings the hands to the region of the anus.

MATERIAL STUDIED

One hundred and eleven women received treatment for genital gonorrhea. In these a positive rectal smear was obtained before the patients were examined proctoscopically. Smears were made from material obtained at the time of the proctoscopic examination as a check on the previous test. In some instances cultures were made.

INCIDENCE

Thirty per cent of the women affected with genital gonorrhea also had gonorrhea of the rectum. In 1927, 1.3 per cent of the women having gonococcic infection of the genitalia had symptoms of rectal involvement; in 1928 symptoms were present in 4.5 per cent. In 1929, when routine smears first were made from the anus and rectum, the diagnosis of gonorrheal proctitis increased immediately. It has varied since then from 25 to 42 per cent. Singer [9] tabulates the published reports of a number of those investigators who observed the incidence of gonorrheal involvement of the rectum as shown in the accompanying table.

This investigator attributed the increase in 1922 and later "to the strong emphasis placed on routine examination for rectal gonorrhea." To digress at this point, I would mention that eight other authors report rectal infection as a complication of the vulvovaginitis of children in percentages ranging upward from 35; the incidence in Singer's own cases was 84.6 per cent. Thus, statistics show that rectal involvement is even more frequent in children than in women.

METHOD OF EXAMINATION

Smears were made from the rectum of every woman who exhibited an acute or a chronic gonococcic infection. A Kelly female urethroscope is inserted into the anus and through it a cotton-tipped applicator is passed into the rectum. Two smears are made from the mucus

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14, 1934.

1. Jullien, Louis: Traité pratique des maladies vénériennes, Paris, J. B. Baillière et fils, 1886.
2. De Bere, C. J.: Personal communication to the author.
3. Peiser, Bruno: Gonorrhea of the Rectum, in Buschke, A., and Langer, E.: Lehrbuch der Gonorrhöe, Berlin, Julius Springer, 1926.
4. Hecker, A. F.: Maladies vénériennes, 1801.
5. Foerster, A.: Lehrbuch der pathologischen, Anatomie, Jena, 1860.
6. Bickel, L., and Abraham, L.: Frequency and Importance of Rectal Gonorrhea in Women, Zentralbl. f. Gynäk. **56**: 200 (Jan. 23) 1932.
7. Hayes, H. T.: Gonorrhea of the Anus and Rectum: Report of Seventy-Five Cases, J. A. M. A. **93**: 1878 (Dec. 14) 1929; Stricture of the Rectum, Tr. Am. Proct. Soc., 1931, p. 173.
8. Rosser, Curtice: Clinical Variations in Negro Pathology, J. A. M. A. **87**: 2084-2085 (Dec. 18) 1926; Venereal Infections of the Anus and Rectum, Texas State J. Med. **29**: 390-395 (Oct.) 1933.
9. Singer, Ludwig: Frequency of Rectal Gonorrhea in Women, Dermat. Wchnschr. **86**: 506 (April 14) 1928.

or pus thus obtained; one slide is stained with methylene blue, the other by the Gram method. The finding of gram-negative, intracellular diplococci is accepted as evidence of gonococcic infection; gram-negative extracellular diplococci are not regarded as diagnostic. That among the rectal flora are other gram-negative diplococci, some of which may be intracellular, is well known, but that these often are confused with gonococci by an experienced bacteriologist who bases his opinion on the usual appearance, size and grouping of the gram-negative diplococci is unlikely. In our experience, cultural methods of isolation and identification have been inconclusive in too many instances to justify confidence in them. Smears containing gonococci generally were found to have 25 per cent or more of pus cells in them.

OTHER METHODS OF EXAMINATION

The Glingar method (rectal washing) is the injection of from 50 to 100 cc. of tepid water into the rectum through a female catheter; the return flow is received into a narrow glass or tube and allowed to settle. Smears are made from the mucoid shreds or particles in the supernatant fluid. Temesváry[10] and others obtain the specimen with a dull curet (Asch's). By some clinicians, Gauss's worm-shaped curet is used.

Singer thus summarizes his experience with the speculum-curet method and Glingar's "washing" procedure in 171 cases: "The Glingar method is most reliable but in the first examination fails in one third of the cases which are practically all diagnosed with the speculum-curet method. Inversely, nearly all cases negative with the speculum-curet method were proved positive by the Glingar method."

In my work, the simple cotton swab and endoscope method is thoroughly satisfactory; it causes the patient no discomfort. A single negative test does not rule out the infection.

SYMPTOMS

Usually symptoms are absent or manifestations of the infection are so slight that the physician's attention is not directed to the anus. In one series of eighty-eight cases which was investigated in 1931 only twelve (14 per cent) presented any rectal complaint, and 86 per cent were symptomless.

This year, among 111 patients examined with the proctoscope, thirty-six (32 per cent) on direct questioning stated that they had anal soreness, usually at bowel movement. Such soreness ordinarily was only moderate, although two patients were quite sore; six (5.4 per cent) had anal pain that was fairly severe, and three of these had anal fissures.

Bleeding, small in amount, usually just a streak on the paper or on the feces, occurred in thirty-two cases (28 per cent). Several patients noticed blood only two or three times. When internal hemorrhoids are present, blood commonly comes from these; this is especially true if the hemorrhoids become superficially ulcerated, as may occur with gonorrheal or any other type of infection. The bleeding usually is noted a few days after or accompanies the onset of the rectal infection. In a few instances it occurred from a few weeks to, in one case, three months later.

ONSET OF ANAL SYMPTOMS

In ten cases the patients stated that their rectal disturbances and gonorrhea started at the same time. That they actually did, however, is uncertain. The majority noticed the rectal soreness or bleeding within three weeks of the onset of the genital infection, but there were a number who had no rectal trouble until after the first month, some subjects not until from two to seven months later.

From a summary of other of my data pertaining only to patients having symptoms of rectal involvement, it appears that rectal infection occurs within the first few days of the genital disease in about one third of the cases, in another third in the first three weeks, and in the remaining third at various times up to several months after the genital infection.

ANAL DISCHARGE

Pus or mucopus occasionally may be seen by the physician on partial eversion of the anus by stretching the skin with the fingers, but it is not seen often enough to be of any diagnostic value. Even if present, it is not often noted by the patient because it is of small amount.

PHYSICAL MANIFESTATIONS

In a careful proctoscopic study of the 111 cases referred to there is no appearance of the rectal mucosa or anal canal characteristic of gonococcic infection. In 28 per cent of the cases, the terminal 6 to 10 cm. of rectal mucosa was reddened, in 31 per cent of the cases it was doubtfully reddened and in the remaining 41 per cent the mucosal color was within normal limits. Thus, in well over two thirds of the cases one could not say that there was definite hyperemia of the mucosa. Other types of low proctitis involving the skin junction present similar appearances.

Incidence of Gonorrheal Involvement

Author	Incidence
Almkvist	3.7% of cases of gonorrhea
Mattissohn	3.8% of cases of gonorrhea
Scheuer	5.0% of cases of gonorrhea
Buschke	8.0% of cases of gonorrhea
Mucha	10.8% of cases of gonorrhea
Harisse	14.0% of cases of gonorrhea
Boas	16.0% of cases of gonorrhea
Huber	24.5% of cases of gonorrhea
Schmidt	27.7% of cases of gonorrhea
Levy-Weissmann	25.35% of cases of gonorrhea
Eichhorn	30.6% of cases of gonorrhea
Baer	38.8% of cases of gonorrhea
Busche-Klopstock	43.1% of cases of gonorrhea
Birger	41.3% of cases of gonorrhea
Gauss-Schultz	75.3% of cases of gonorrhea

Singer's Own Records of Gonorrheal Proctitis

Incidence	Year
3.12%	1920
5.61%	1921
23.8%	1922
12.9%	1923
13.0%	1924
31.9%	1925
32.0%	1926
33.9%	1927

The anal skin at the mucocutaneous juncture was somewhat reddened or the small linear vessels in it were rather prominent in seventy-five of the 111 cases (67.5 per cent); in fifty-five slightly, in sixteen moderately, in one patient severely reddened. Hence in two thirds of our series there was some reddening of the skin margin. Mucopus, generally small in amount and often found as flecks or strings adherent to the wall, was noted in seventy (63 per cent) of the patients. Yellow liquid pus was seen in only six cases and was distributed diffusely over the last inch or last few inches of the rectum. I would emphasize this: The presence of mucopus in the last inch or two of the rectum is the most suggestive finding with respect to the diagnosis

10. Temesváry, Nikolaus: Rectal Gonorrhea in Women, Zentralbl. f. Gynäk. 54: 3140 (Dec. 13) 1930.

of gonococcic proctitis. It may be the only suggestion toward the diagnosis in a patient who states that she does not have gonorrhea or its symptoms. In the ordinary proctoscopic examination in which the patient is not a gonorrheal suspect, this finding demands the examination of a smear. In the gonorrhea suspect a smear for microscopic study is demanded.

DIAGNOSIS

Diagnosis is based on finding gram-negative intracellular diplococci in the smear made from material swabbed from the bowel wall and the upper part of the anal canal. A number of cultures were made on this last series (of 111 cases) and the procedure was repeated in some cases, but the results were unsatisfactory, as already stated. It is my opinion that a properly interpreted gram stain can be relied on.

COURSE

An early acute phase may occur, but that it is often absent is apparent. The course is slow and tedious, often several months, but cure may follow adequate care in from three to six weeks. Several weeks to months probably is the usual duration, as many patients discontinue treatment before being cured. Gonococcic infection, if untreated, will persist in the rectum a long time. I have found it a year after the initial genital infection. Reinfection definitely cannot be ruled out.

Gonorrheal proctitis is a potential source of genital reinfection. Temesváry states that this does occur; Bickel and Abraham state that it occurs only rarely. My own experience confirms that of the latter authors, who state that "the significance of rectal gonorrhea lies in its being a possible source of infection of the genitalia." In itself, rectal gonorrhea is usually not serious in the white races; in exceptional cases it may cause a stricture. In Negroes, inflammatory rectal stricture is more frequent, and this is regarded by many as an aftermath of rectal gonorrhea.

COMMENT

In women, especially, rectal gonorrhea is a more frequent complication of genital gonorrhea than is generally known. The chief reason why it is regarded as rare is that it is often overlooked. The conception that the infection usually causes a severe rectal inflammation is not true; anal ulcer, rhagades or condylomas are not common concomitants. Perhaps too many students and physicians have obtained their present notions of rectal gonorrhea from the free clinic or hospital dispensary, where Negroes are treated and where proctitis obiterans patients are seen and the probable relation of gonorrhea to the stricture has been stressed.

In 111 cases, three presented superficial fissures; perianal suppurative disease was found in three cases: two presented fistulas and one a short sinus communicating with an inflamed fibrosed crypt. In four patients the mucosa of the terminal rectum had a nodular surface; i. e., the early polypoid change that results from chronic mucosal infection. Superficial erosions, in small spots 1 to 2 mm. in diameter, were observed on the mucosa just above its junction with the skin in four instances. No rectal or anal ulcers were encountered. Although a number of these cases were examined with the proctoscope very early in the course of their genital and rectal infections, the very severe cases described by some writers were not observed. Some of the women had much discomfort, especially at defecation, but not many, and the anorectal inflammation was not uniformly proportionate to the complaint of the patients.

Stühmer,[11] who accidentally conveyed the infection from one patient to twenty-five others by means of an infected glove, has described four phases of the disease. Only the last two usually are seen. In the first phase the mucosa is swollen and fiery red, the mucosal folds are obliterated, the lumen is quite filled with swollen mucosa, and the central orifice is square, irregular or arch shaped. The mucosa bleeds easily and on it there is greenish yellow mucopus. The anus is reddened and very sore. In the second phase the swollen redundant mucosa recedes, the normally arched lumen reappears, the redness lessens, seedlike swellings, the color of the adjacent mucosa, are seen, the pus becomes thicker and does not adhere to the wall, and inflammation still is present in the anus. The third phase appears after one or two days; this is the proctoscopic picture commonly seen. There is considerable swelling and redness of the mucosa; the seeded appearance still is generally present, and thread-like pus is noted, which is quite adherent to the bowel wall. The fourth phase is characterized by the persistence of pus on the normal mucosa.

Stühmer's experience is quite different from that in my series. This may be accounted for in part by the fact that he watched the tissue changes right from their inception. He may have been concerned with a more than ordinarily virulent strain of gonococci, which he transferred. Then, too, the lesions observed by Stühmer were in men; two of the most severe cases that I have seen were in men, but I am not prepared to state that gonococci cause a more severe type of inflammation in the male than in the female rectum.

TREATMENT

Various procedures have been recommended for the management of the acute stage; for example, rest in bed, a bland diet, hot sitz baths, anal douches, local medication, and the avoidance of instrumentation. However, the disease is not often seen in this stage.

The patients in my series were treated by rectal instillations of 1 ounce (30 cc.) of 5 per cent mild silver protein twice daily. If anal soreness was prominent, an ointment or suppository containing a local anesthetic was employed. The bowels were regulated. The patients were instructed to instill the mild silver protein through an 18 or 20 French soft rubber catheter. No instances were seen in which the catheter traumatized the tissues. Objections to the use of the catheter appear unfounded; it is a practical method of having the patient receive medication at proper intervals. Hayes advocates a blunt-tipped bulb syringe to inject mild silver protein or similar medication. Smears were prepared from the rectal mucosa once a week in order to determine the results of medication.

The patients having fistula in ano were operated on when the disease was chronic but while smears were still positive. The wounds healed normally.

CONCLUSIONS

1. Gonococcic infection of the rectum is a common complication of the genital infection in women.

2. Because symptoms usually are mild and often absent, frequently the lesion is not diagnosed.

3. Routine rectal smears should be made of all women who exhibit a gonococcic infection of the urethra or the

11. Stühmer, A.: The Clinical Course of Rectal Gonorrhea, Dermat. Ztschr. **32**: 12, 1921.

cervix. Such routine examination is of value in any gynecologic or urologic service.

4. Although rectal gonorrhea usually is not serious in itself it is of some importance as a possible source of reinfection. Because it persists in the rectum after the genital tract is clear, the rectum must be considered as a source of reinfection when all other possibilities have been excluded.

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ABSTRACT OF DISCUSSION

DR. HERBERT T. HAYS, Houston, Texas: Many cases of rectal gonorrhea are not found unless they are looked for, and in white women especially they may be asymptomatic. Dr. Martin reports the occurrence of gonorrheal proctitis following genital gonorrhea in women in from 25 to 42 per cent, but in my experience it has been slightly higher. The diagnosis is easily made in early cases, but in the chronic cases, which are often associated with complications such as stricture and fistula, repeated smears are necessary to discover the organisms. Dr. Martin suggests the use of 5 per cent mild silver protein in gelatin twice daily instilled with a catheter. I usually use the mildest silver solution possible and instil it with a blunt-tipped syringe placed against the anus, forcing the liquid in by pressing on the bulb. I have thought this more advisable in the early cases than inserting any instruments into the rectum, as I believe any trauma to this already inflamed mucosa is likely to cause trouble. In the more advanced cases, however, I do not think there is any contraindication to the insertion of a catheter and irrigating the rectum. Gonorrheal proctitis is often very persistent, but this is the case when there are certain types of lesions which harbor the infection. Most important of these are stricture of the rectum, fistula-in-ano, hemorrhoids, cryptitis, prolapse and fissure. It seems especially hard for these cases to immunize themselves, and it is best to operate on these complicating factors and eliminate them if possible. I have had to do this in a number of chronic cases and the wound healed satisfactorily but required rigid after-care. In most instances gonorrheal proctitis in white women will clear up without any complications. If complications do arise, they can be eradicated and cured except in the few cases in which a stricture develops. However, in Negro women there is quite a different history. Treatment is exceedingly unsatisfactory and many develop a rectal stricture, the infection persists for years, and they are more or less permanently incapacitated.

DR. CURTICE ROSSER, Dallas, Texas: Dr. Martin's description of the course, symptoms and complications in his cases confirm in many details my observations in a much smaller group reported before this section in 1933. Reddening, not ulceration of the mucosa, of the upper anal canal and of the skin of the lower anal canal and mucopus, occasionally yellow, were the two variations from normal most commonly seen through the proctoscope. Dr. Martin makes no mention of the rôle the anal crypt plays in "anal gonorrhea." I must continue to urge the use of this term as more accurate and descriptive than "rectal gonorrhea" for a condition in which the major lesions, the crypts in which the organisms secrete themselves in the chronic stage, and the complications, are all in and about the anal canal, not in the ampulla of the rectum. My conviction that the anal crypts serve as reservoirs of infection in anal gonorrhea was first expressed before this section eight years ago. In 1933 I emphasized this contention by reporting cases in which crypt infection was directly observed. Such complications as abscess, fistula, erosions and granulations of the mucosa above and adjacent to the dentate line are best explained by the presence of a chronic infection in the anal crypts, hidden foci analogous to the urethral glands and prostate in gonorrhea of the conventional type. The work of Tucker and Hellwig, reported this year, is further confirmation of the fact that the gonococcus embeds itself in and about the crypts of Morgagni. While Dr. Martin, like other writers, has almost studiously avoided mention of the anal crypts, the lesions he relates serve as confirmatory evidence of their importance in the disease. The author called attention to the fact that chronic gonorrheal infection may persist long after all symptoms subside and be a potential source of reinfection. Vigorous treatment directed to the anal crypts in the chronic stage is the logical answer to these facts.

DR. CLAUDE C. TUCKER, Wichita, Kan.: At the City and County Clinic for the past year I have asked that all persons with a positive vaginal finding of gonococci be sent to my clinic for proctoscopic examination. Many had no symptoms, but a big percentage showed positive smears with duct and crypt infection. The anal ducts are the foci of infection, the anus being constantly bathed in pus, especially at the time of defecation. The gonococci enter the ducts through the crypts of Morgagni. Gonorrheal infections in the anal ducts, periurethral and prostate, give the same microscopic picture. Embryologic studies have shown that the anal ducts, the para-urethral ducts in the female, and the prostate gland in the male, develop from the same structures; namely, the embryologic cloaca. Anal ducts play apparently the same rôle in gonococcic reinfection as do the prostatic and para-urethral ducts.

DR. CLEMENT L. MARTIN, Chicago: One of the chief reasons for presenting this paper was to record the usual clinical and proctoscopic picture of rectal gonorrhea. I wish to avoid distortion of this picture by overemphasis of crypt and duct infection. The data in this series speak for themselves. I am following the work of Tucker and Hellwig with much interest. The anal duct phase was purposely omitted. That the anal ducts constitute an important factor in the persistence of rectal infection is a logical assumption. That such ducts exist is proved, but that they are always or even generally present has not been sufficiently demonstrated. That they are normally present is certainly possible and I hope that the work of Tucker and Hellwig and those who are trying to verify their observations will settle the point. The small percentage of this series having demonstrable lesions resulting from duct or crypt infection suggests on its face my being conservative until further pathologic data from excised tissue are available.

SYMPTOMS IN EARLY STAGES OF INDUSTRIAL PLUMBISM

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[EDITORIAL NOTE.—This paper, together with the papers of Drs. Gray and Belknap, which follow it, concludes the symposium on lead poisoning. In the last issue were published the papers of Lanza, of Aub and of Kehoe, Thamann and Cholak.]

My purpose in this paper is to review briefly, from the point of view of the industrial physician, the various signs and symptoms commonly associated with plumbism and to discuss more fully some of those observations which may usually be considered of the greatest value in its early diagnosis. It is obvious to those acquainted with this problem in industry that efforts to reduce the incidence of industrial plumbism will be greatly handicapped if emphasis is not placed on such observations as may be considered presumptive evidence of lead absorption or lead intoxication.

From an early date medical literature has been replete with reports dealing with the toxic effects of lead. With few exceptions the signs and symptoms considered in the present discussion have been fully described by early medical workers. Later scientists are to be given credit for experimental studies made to determine the action of lead on the body tissues, and definite contributions have been made by those groups studying hygienic conditions in industry and their relation to the health of the men employed.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

Many conditions may influence the reaction of the tissues to lead. Such personal factors as past and present illnesses, age, hygienic habits and constitutional development, and such physical factors as type and amount of lead absorbed, its rate of absorption or solubility in the body fluids, and the like, all affect the body's response to this metal.

A complete record of all the signs and symptoms that have been reported to be associated with plumbism would of necessity contain most of those common to all body ailments. This discussion is purposely limited to those signs or symptoms which are most frequently exhibited. Although no single sign or symptom may be considered pathognomonic of plumbism, certain interest may be attached to the characteristic grouping of these symptoms and the period in the course of the disease when they are usually manifested.

The present remarks are based on a review of the literature and on observations made on men employed in the storage battery industry.[1] In all, about 1,500 storage battery employees were observed during a period of nearly two years, from June 1928 to February 1930. These workers may be considered in two classes: (A), a group suspected of plumbism reporting to the clinic for examination, and (B), a group actually on compensation for lead poisoning.

For convenience the common symptoms are considered in groups referable to the system involved. By a further classification of them within groups according to the period in the course of the disease when they are usually manifested, it is possible to offer a summary, which, in general, may serve as a basis for making a diagnosis of:

1. Abnormal lead absorption.
2. Incipient lead intoxication.
3. Definite lead poisoning.

It must be borne in mind, however, that proper and valid interpretation of such signs is arrived at only after due consideration of other facts elicited through the taking of a complete occupational and past medical history.

COMMON SIGNS AND SYMPTOMS

General Appearance.—Although it is possible for plumbism to develop without producing much, if any, change in the general appearance of an individual, close observation of persons possibly exposed to a lead hazard will often reveal suggestive evidence of abnormal lead absorption. Some of those changes most frequently observed are shown in table 1A. The most common may be the development of a lead line at the margin of the gums, about which much has been said. Its presence is indicative of the absorption of lead at some time. The same, however, might be due to the absorption of lead at so slow a rate as would not necessarily cause disability. Furthermore, it is often more pronounced in those cases in which mouth infections have been neglected. Less than half of the battery workers suffering from plumbism showed this sign. That it cannot be relied on as early evidence of lead intoxication is shown by the fact that many severely poisoned persons do not show any trace of a lead line, while others with no definite evidence of intoxication may exhibit marked lead lines.

One of the most significant, so far as indicating that the absorption is recent, is a perceptible change in the individual's disposition. Such persons are prone to be easily flustered and may appear moody. Because of such changes, men were sometimes ordered to the clinic for examination by their foreman.

Early suggestive evidence of incipient lead poisoning, aside from the lead line, is sometimes indicated by the sclera becoming slightly jaundiced. Aub and his co-workers[2] state that pallor is the most constant sign of early intoxication. In the group of battery workers, considered as a class, showing signs of incipient lead poisoning, jaundice was more often recorded than was pallor, but in the group on which a definite diagnosis of lead poisoning was made pallor was found as frequently as any early change in general appearance.

The most common subacute and chronic forms of plumbism, in addition to the symptoms noted earlier, are usually accompanied by certain changes in the physical appearance, best described by the term "premature aging." These patients are characterized by their list-

TABLE 1.—*Common Signs and Symptoms Observed in Cases of Plumbism and Excessive Absorption of Lead*

Suggestive Evidence of Lead Absorption	Suggestive Evidence of Incipient Intoxication	Suggestive Evidence of More Advanced or Definite Plumbism
	A. General Appearance	
Restive, moody, easily excited, "flustered" Lead line	Pallor Lead line Jaundice	Anemia Lead line Jaundice Emaciation "Premature aging"
	B. Digestive System	
Persistent metallic taste Slight loss of appetite Slight constipation	Metallic taste Definite loss of appetite Coated tongue Slight abdominal colic Constipation	Metallic taste Increased loss of appetite Nausea and vomiting Coated tongue Marked abdominal colic Rigid abdomen Marked constipation Blood in the stool
	C. Nervous System	
Irritable Uncooperative	Slight headache Insomnia Slight dizziness Palpitation Increased irritability Increased reflexes	Increased headache Increased insomnia Increased dizziness (ataxia) Confusion Marked reflex changes Tremor Fibrillary twitching Neuritis Visual disturbances Encephalitis (hallucinations, convulsions, coma) Paralysis
	D. Miscellaneous Changes	
None	Muscle soreness Easily fatigued Hypotension	General weakness Joint pains Hypertension
	E. Urine Examination	
Positive test for lead	Positive test for lead Trace of albumin Few granular casts	Positive test for lead Increase in albumin and casts Hematoporphyrin present Hematuria
	F. Blood Changes	
Polycythemia Polychromatophilia Increased platelets Percentage of reticulocytes about doubled	Normal red blood cell count and normal hemoglobin Further increase in reticulocytes From 50 to 100 stippled cells per hundred thousand erythrocytes	Decrease in hemoglobin Decrease in total number of red blood cells Increase in all forms of basophilic cells Increase in percentage of mononuclears Anisocytosis and poikilocytes Nucleated red cells present in the peripheral circulation Decreased platelets

1. Russell, A. E.; Jones, R. R.; Bloomfield, J. J.; Britten, R. H., and Thompson, L. R.: Lead Poisoning in a Storage Battery Plant, Pub. Health Bull. 205, 1933.

2. Aub, J. C.; Fairhall, L. T.; Minot, Anne S., and Reznikoff, Paul: Lead Poisoning, Medicine Monographs, Baltimore, Williams and Wilkins Company 7, 1926.

less attitude, stooping posture, apparent loss of weight, strength and muscle tone, and general anemic condition. This premature aging and wasting may persist long after removal from exposure.

Digestive System.—Some observers believe that the signs and symptoms referable to the digestive system are those most frequently found to be the earliest evidence of lead absorption and intoxication. In table 1 B are given those signs which will probably be most commonly exhibited because of changes in the normal digestive processes, arranged according to the period in the course of the disease when they are most likely to occur.

In our group of workers suspected of plumbism, such signs as a persistent metallic taste, slight loss of appetite for the morning meal, and a tendency to constipation were sometimes complained of when no other cause for their presence was elicited than that the patients might be absorbing abnormal amounts of lead. An increase in these symptoms and further evidence, such as a foul breath and coated tongue and slight abdominal colic, was noted in those cases proved to be incipient lead poisoning. All these signs were exaggerated in the moderate or advanced cases. The colic associated with plumbism is usually quite marked. It was complained of in more than 90 per cent of the battery workers in whom definite cases developed and by all those affected sufficiently to be entitled to compensation. Not only was the colic more severe in the advanced cases but also, during an attack, the abdomen would become very rigid. Another feature of this colic associated with plumbism is that the pain is somewhat lessened by pressure on the abdomen. The patient is prone to hold the hands firmly over the abdomen during an attack of colic or, if he is able to be up and about, will stop and bend over the back of a chair or some other object, since firm and continued pressure will usually bring some measure of relief. In some patients, obstipation develops which necessitates drastic measures to overcome it. Marked loss of appetite, nausea and vomiting were common. Occasionally, following severe colic, blood may be found in the stool.

Nervous System.—The signs and symptoms referable to the nervous system are of special importance in the detection of early evidence of abnormal lead absorption. In table 1 C the signs and symptoms associated with nervous changes resulting from lead absorption are shown, classed in groups denoting the time when they were most often evident.

The group of workers suspected of lead poisoning all showed mild signs of increasing irritability and nervousness, usually before they offered any complaints. The group that proved to be suffering from plumbism invariably gave a history of such nervous symptoms having antedated the more severe manifestations of lead poisoning. They often remembered that they had been subject to slight headaches, which tended to clear up after they had been at work for a few hours. This, at that time, they were prone to account for by the fact that they had not slept so well or that the bowels were slightly constipated. Of course, loss of sleep and worry from any number of causes may produce like symptoms, but careful questioning will in most cases enable the examiner to judge whether there are other reasons to account for such nervous symptoms. Failing any other explanation for the exhibition of these early nervous signs by persons with a known or suspected exposure to lead, one may advantageously accept this as presumptive evidence of abnormal lead absorption or incipient intoxication. The tremor and fibrillary twitching appearing somewhat later are comparable to that associated with alcoholism. It is more noticeable when stimulated by external irritation or fatigue. This fine fibrillary twitching was most often observed in the muscles of the face and upper extremities and was more pronounced when the person was tired. The workers presenting objective nervous signs often complained of dizziness and headache and seemed to have lost interest in their work. Occasionally, one of the earliest complaints was palpitation, more noticeable after the day's work. In my experience visual disturbances were seldom mentioned, even by those off duty because of plumbism. Wrist drop, so often reported as resulting from lead poisoning, was not observed among the group of storage battery workers, nor was there any record of the condition developing among previous employees at that plant. Reflex changes were noted in more than 70 per cent of the cases of definite plumbism. These changes are of particular interest when those examined are considered in two groups: One group, suffering from their first attack, showed increased reflex action. This increase was quite marked, especially in those cases of poisoning showing marked irritability, rigid abdomen and rapid development. On the contrary, those suffering from relapses or repeated attacks, in whom the condition had progressed to a more chronic stage, commonly showed an appreciable decrease in reflex action.

Some of the nervous signs indicating cerebral involvement, such as the development of delirium, hallucinations, maniacal tendencies, convulsions and coma, were not observed among the storage battery employees. One case was observed in which the initial diagnosis was encephalitis; however, this case was not fatal and occurred in a man who was afterward discovered to have been previously an inmate of the state insane asylum.

Miscellaneous.—Those changes chiefly associated with general nutrition and muscular development, but also closely related to the neurocirculatory systems, are listed in table 1 D.

Early in cases of definite plumbism the individual will often complain that he tires easily and is aware of a vague muscle soreness, the latter affecting usually the muscles of the back and thigh. Some of the cases, possibly too few to be of statistical significance, were found in the early stages to exhibit a slight hypotension. Weakness was not an early symptom. When complained of early in the development of plumbism, it could be in part at least attributed to a lack of nourishment and rest resulting from loss of sleep and dietary restrictions. In more advanced and usually more chronic cases there is a frequent complaint of definite loss of strength and weight and a constant tired feeling even after a prolonged rest. Joint pains are particularly likely to be chronic and are often difficult to interpret satisfactorily. Hypertension, which has sometimes been reported as associated with chronic plumbism, was not shown to be more frequent among the group of battery workers than it has been shown to occur among other workers of similar ages. This may be explained by giving consideration to the relative rapidity with which many of the cases developed.

LABORATORY OBSERVATIONS

Aside from the signs and symptoms observed by questioning and by examining workers suspected of

absorbing abnormal amounts of lead, all agree that certain facts to be learned from laboratory examination of the blood and urine are almost indispensable. Some of the more common changes that may be looked for in making an examination of the urine excreted by persons who may be exposed to a lead hazard are given in table 1 E.

By spectroscopic examination of the blood and other body fluids it has been proved possible to demonstrate definite evidence of lead intake; however, such procedures are not always adaptable to routine use by the average physician. In recent years a roentgen examination of the bones also has been shown to be an aid in detecting evidence of lead absorption.

Examination of Urine.—The presence of albumin and granular casts in urine excreted by persons previously well, when accompanied by other evidence of lead intoxication, may serve to indicate somewhat the degree of lead poisoning. No one will question the finding of abnormal amounts of lead in the urine as evidence of absorption. Some discussion and disagreement have accompanied the efforts of workers to establish what may be accepted as the maximum amount of lead that may be found in urine excreted by persons normally. Badham [3] believes that the presence of more than 0.05 mg. of lead per liter of urine is evidence of mild lead poisoning if accompanied by other evidences of the disease. Kehoe and his associates [4] report finding as much as 0.08 mg. of lead per liter of urine excreted by normal persons with no known exposure to lead. Aub [2] is of the opinion that too much weight should not be placed on the presence or absence of lead in the excreta, owing to the fact that during exposure lead is not always excreted and that its presence does not always mean intoxication. Under certain conditions, excessive lead found in the urine of persons with a known or suspected exposure to lead, who on previous examination were not found to excrete abnormal amounts, would indicate recent absorption possibly earlier than other changes. Nevertheless, from the point of view of the average physician, owing to the equipment, training and time required for making such chemical examination, this method of detecting early absorption of lead is not so practical as other laboratory procedures.

Some writers report the finding of hematoporphyrin in the urine as one positive evidence of lead poisoning. I found this to be so in but a small percentage of cases, and others report that it is not a constant finding.

Blood Changes.—Many of the restrictions applicable to the acceptance of lead in the urine as an early sign of lead absorption hold also for positive blood changes. Microscopic examination of the blood, however, is much more practical, and when observations so obtained are considered in the light of knowledge gained by the history and the physical examination, they furnish information of real value in making a diagnosis. Some of the more common changes in the blood picture to be looked for in various degrees of lead absorption are given in table 1 F.

Various degrees of anemia are shown by patients suffering from chronic lead poisoning, but this has not been proved to be an early sign of the effects of lead absorption. The changes in the morphology of the red blood cells parallel the decrease in total number and the decrease in the amount of hemoglobin. In about 5 per cent of the cases of chronic plumbism this anemia had progressed to the point at which nucleated red blood cells were found in the peripheral circulation.

Another point of interest, concerning which little mention has been made, is the fact that some of the more advanced cases of plumbism will show a decrease in the number of blood platelets. Some of the early cases, on the other hand, will show an increase in platelets at the time when a definite condition of polycythemia is present. In a group of forty-two cases of moderately severe plumbism, I found an average platelet count of 130,000 per cubic millimeter, as compared with similar counts made on controls, which ranged from 250,000 to 700,000. No case presenting a decrease in platelets showed any special tendency to hemorrhage.

The reduction of platelets in chronic cases may be explained by the other changes in the blood picture and alterations present in the bone marrow. Aub and his associates [2] report that the irritating effect of lead on the bone marrow ultimately produces a definite change, resulting in a decreased output of normal blood cells, the release of immature red cells and a relative increase in the number of mononuclear leukocytes.

Because considerable change must take place in the bone marrow before a reduction in the number of platelets is manifested, the finding of such a decrease is of no value in the detection of early lead poisoning. This finding assumes particular significance in determining the extent of bone marrow injury and the inadvisability of permitting persons presenting this sign to be subjected to further exposure.

In the group examined who were on compensation for plumbism, a relative increase of a slight degree in the number of mononuclear cells was found more often than was a decrease in platelets. However, neither of these changes was noted in those cases showing the earliest and minor signs of lead absorption or incipient intoxication.

There is one blood change that is generally considered of extreme importance as a sign of lead absorption and is very practical in its application. The cases of plumbism that show no increase in the number of basophilic cells are usually of such long standing and so far advanced that no trouble is experienced in making a definite diagnosis. While the phenomenon of stippling has never been fully explained, the presence of stippled cells in blood films made from persons suffering from plumbism has been given more consideration than any other one finding. It is true that stippled cells will be found in the blood of persons suffering from other conditions associated with various degrees of anemia, but in no other disease are stippled cells found in such numbers in the absence of other major blood changes. In cases of acute lead poisoning it is possible that their presence will be one of the earliest signs of lead absorption but since most industrial lead poisoning is of a chronic form there are other signs that will be present as evidence of basophilia before the appearance of the stippled cell.

As mentioned previously, often the early effect of lead on the marrow is of such a nature that instead of a decrease in the total number of erythrocytes there is

3. Badham, C.: Lead Poisoning: Studies in Industrial Hygiene No. 7, report of the Director General of Public Health, New South Wales, for the year ended Dec. 31, 1925.

4. Kehoe, R. A.; Thamann, Frederick, and Cholak, Jacob: On the Normal Absorption and Excretion of Lead: II. Lead Absorption and Lead Excretion on Modern American Life, J. Indust. Hyg. **15**: 273 (Sept.) 1933.

actually a condition of polycythemia. Alice Hamilton [5] states that the stippled cells are really degenerated reticulocytes. Whether these cells are degenerative forms may not be proved conclusively, but in recent years, particularly, sufficient evidence has been produced to prove that they are the juvenile red blood cell. The work of Key[6] and earlier works of Askanazy,[7] Biondi,[8] Hawes,[9] Robertson [10] and others give satisfactory evidence that stippled cells are but one manifestation of polychromatophilia. The work of Schwarz,[11] Seiffert [12] and McCord [13] is based on this principle. Certainly if the basophilic cells or reticulocytes are the ones eventually to become stippled, owing to the action of lead, an early increase in such cells is to be expected before stippling to any great extent will become manifest. Therefore the particular method of examining the blood for the smallest increase in these new cells should furnish the earliest evidence of any irritating or toxic action of lead, especially in those persons recently exposed for the first time who previously have shown no increase in percentage of reticulocytes. McCord's method of estimating the increase in basophilia is a distinct improvement over that of counting only the stippled cells from a fixed preparation. Owing, however, to the fact that by his technic it is not possible to measure this increase when it is slight, some of its advantage is lost. Any standard method of estimating an increase in reticulocytes should give positive evidence before that obtained by a thick drop method. In the work reported here a slightly different basic staining technic was used than the technics described by Schwarz,[11] Seiffert [12] or McCord.[13] However, in principle they were all based on the method proposed by Ehrlich [14] for staining the basophilic substance in the erythrocyte. By using thin films and fixing but half of the film through its long dimension, not only was I able to estimate the number of cells in which a given number of reticulocytes were found but also the fixed portion furnished a preparation from which the number of stippled cells per million erythrocytes could be estimated. Further study of this method proved that the reticulocyte counts obtained by such a technic were the same as those obtained when vital staining methods were used.[15] Probably one of the clearest demonstrations of the relationship between the diffuse polychromatic cell, the punctate basophilic cell and the reticulocyte is given by the report of Whitby and Britton.[16] A summary of this report states that "polychromasia and stippling are both manifestations of the phenomenon of reticulation. The polychromatic cells of Leishman stained films and the reticulocyte of supravitally stained films are identical and normal. Stippling is the same chromatic substance slightly altered by lead or other poison. The alteration appears to have no effect on the efficiency or life of the cell."

In the present study a parallel increase in reticulocytes was found with the increase of stippled cells, but this increase in reticulocytes was always manifested prior to the finding of a significant number of stippled cells. In more advanced cases the reticulocyte count was always much greater than that of stippled cells. Cases were examined that showed stippled cell counts as low as 6 per hundred thousand erythrocytes, and reticulocyte estimations made on these individuals at the same time showed from two to three times as many as are normally present. To determine the stippled counts when they occur in such small numbers requires from two to three hours, while the accompanying increase in reticulocytes may be determined in a few minutes. Table 2 shows the correlation of the stippled cell and the reticulocyte count and the marked increase in the number of reticulocytes to be found early in the course of lead absorption.

TABLE 2.—*Correlation of Stippled Cell and Reticulocyte Count*

Stippled Cells per 100,000 Red Blood Cells	Ratio of Number of Reticulocytes Found in Workers Suspected of Plumbism to the Number Found in Nonexposed (Applicants)
Applicants	
None	1.00
Workers showing	
Less than 6	2.00
6 to 9	3.31
10 to 62	4.18
63 to 159	5.34
160 to 399	8.78
400 to 999	13.73
1,000 to 1,599	22.71
1,600 to 2,499	27.90
2,500 to 3,999	38.61

I saw men removed from exposure, or whose working environment was improved because this early change was manifested, in whom disabling plumbism did not develop, while in others who were left until greater increases were noted, plumbism developed to the extent that they lost time from work, and some actually were placed on compensation for lead poisoning. Aub [2] reports reticulocyte counts of from 6 to 16 per cent in two lead colic patients with erythrocyte counts of approximately 3½ million. Fleckel and Tschernow [17] reported a method of classifying the degree of lead absorption in individuals by the percentage of their red blood cells showing reticulations. Bottrich [18] also reports on the usefulness of this finding in cases of plumbism. I. M. Flekel [19] reports the value of reticulocyte estimation in diagnosis in cases of chronic lead enterocolitis. It must be remembered, however, that the presence of an increase in reticulocytes is due to the same cause that later leads to the presence of abnormal numbers of stippled cells in the blood, and therefore records of counts made before exposure and at intervals during exposure are of importance in judging the change produced.

5. Hamilton, Alice: Industrial Poisons in the United States, New York, Macmillan Company, 1929.
6. Key, J. A.: Studies on Erythrocytes, with Special Reference to Reticulum, Polychromatophilia and Mitochondria, Arch. Int. Med. **28:** 511 (Nov.) 1921.
7. Askanazy, S.: Ueber ein interresanten Blutbefund bei rapid letal verlaufender perniciöser Anämie, Ztschr. f. klin. Med. **23:** 80-92, 1893.
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14. Ehrlich, Paul: Beobachtungen am anämischen Blut, Berlin klin. Wchnschr. 43, 1881, No. 3.
15. Jones, R. R.: The Estimation of Basophilic Cells (Reticulocytes) by Examination of Ordinary Blood Film, Pub. Health Rep. **48:** 1011 (Aug. 18) 1933.
16. Whitby, L. E. H., and Britton, C. J. C.: The Relation of the Stippled Cell and the Polychromatic Cell to the Reticulocyte, Lancet **1:** 1173 (June 3) 1933.
17. Fleckel, I., and Tschernow, I.: Zur Frühdiagnose der Bleivergiftung, Zentralbl. f. Gewerbehyg. **7:** 65-72 (March) 1930.
18. Bottrich: Die Bedeutung der basophil getüpfelten roten Blutkörperchen, speziell für Begutachtung von Bleikrankheiten, Zentralbl. f. Gewerbehyg. **9:** 3-28 (Feb.) 1932.
19. Flekel, I. M.: Diagnosis of Chronic Lead Enterocolitis: Presence of Reticulocytosis, Sovet. vrach. gaz., July 15, 1932, p. 793.

DIAGNOSTIC STANDARDS

The Committee on Lead Poisoning of the American Public Health Association [20] has given an excellent discussion on the subject of standards of diagnosis based particularly on the degree of disability indicated by certain groups of signs. It realized that much of the confusion existing in the ranks of the medical profession regarding the diagnosis of plumbism, its degree and the amount of disability, was due to the lack of uniformity in terminology used to express opinions. Its report contains a classification of terms used and it supplies definitions applicable to their use. This report properly emphasizes the necessity of obtaining complete occupational and medical histories and the consideration of all such information as may be gained from them along with the results obtained from careful physical examination and laboratory studies.

Newman, McConnell, Spencer and Phillips [21] devised such a standard for use in the particular study that they were carrying on among a group of pottery workers. This standard as applied to their work aided greatly in the making of an orderly analysis of their records, and some such method is often quite necessary in the making of a statistical analysis of observations from a group. However, if such standards were closely relied on in the individual case as seen by the physician, some errors in diagnosis would certainly follow.

Often one finds references to such standards as proposed by Badham [3] and others, which have been suggested to be of value when necessary to express the stage or severity of initial attacks of lead poisoning.

Aub and his associates [2] in their monograph on lead poisoning offer helpful criticism regarding the value of such standards. In brief, it is their opinion that these standards place too much significance on a single symptom, regardless of the degree of change indicated by it. They state that in the last analysis the diagnosis of plumbism must depend on keen judgment and that no fast rules can be adopted.

For the purpose of classifying the degree of disability associated with an attack of plumbism, it may seem advantageous to outline some group of symptoms that may usually be assumed as indicative of the severity of the attack; but, as an aid in making a diagnosis before definite intoxication, these standards are less practical. In each instance, all factors must be considered and the same procedure followed in arriving at a diagnosis as is necessary in other disease presenting constitutional reactions that are so varied and extensive.

SUMMARY

In dealing with the problem of industrial plumbism, emphasis should be placed on those signs and symptoms commonly exhibited early in the course of absorption or intoxication. All observations should be considered in their relation to the entire clinical picture in order to arrive at a diagnosis, especially in the preintoxicative stage. All changes listed as presumptive evidence should be thoroughly investigated. From a practical point of view it is believed that, by careful watching for an early reticulocyte response, the physician will be able to detect evidence of lead absorption prior to the development of definite plumbism.

20. Report of the Committee on Lead Poisoning, American Public Health Association, presented before the Industrial Hygiene Section at the annual meeting in October 1929.

21. Newman, B. J.; McConnell, W. J.; Spencer, O. M., and Phillips, F. M.: Lead Poisoning in the Pottery Trades, Pub. Health Bull. 116, May 1921.

RECENT PROGRESS IN THE TREATMENT OF PLUMBISM

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The opportunity for studying a group of patients with lead poisoning was afforded because of the contentious situation that arose in the adjudication of their disability. In one group of individuals a diagnosis of chronic lead poisoning had been made from six months to two years prior to coming under my observation. The problem that arose was to determine whether or not protracted subjective symptoms were due to chronic lead poisoning and, if so, to institute a method of treatment. There were nine patients in this group.

In a second group, more recently exposed to either the ingestion or the inhalation of lead, a diagnosis of subacute lead poisoning had been made. The problem here was to determine the best type of treatment to bring about recovery. There were four patients in this group.

In a third group (two patients) it was alleged that subjective symptoms of recent origin were due to contact with lead over a period of many years. The problem was to determine whether or not lead was a causative factor in the production of symptoms.

LITERATURE

Recent progress in the treatment of lead poisoning has been due largely to the studies of American investigators. A knowledge of conditions hindering or favoring the liberation of lead is naturally of importance. In 1926 Aub, Fairhall, Minot and Reznikoff [1] published their observations on the excretion of lead following an exhaustive investigation on lead metabolism in man and in cats. They found that lead could be either stored or excreted by distorting the calcium metabolism. A negative calcium balance increases the rate of lead excretion, while a positive calcium balance favors the storage of lead. The rate of lead excretion can further be increased by the addition of ammonium chloride or phosphoric acid. "Deleading" treatment is to be recommended only when acute active symptoms are not present. In further studies Aub and Hunter [2] show that the parathyroid hormone increases the rate of lead excretion in patients suffering from lead poisoning.

Recently, Kehoe, Thamann and Cholak [3] have made careful and intensive studies on the normal absorption and excretion of lead. Their studies on the behavior of lead in the human organism are important contributions to knowledge. Kehoe has advised against the administration of agents which are believed known to promote a quick release of lead from the tissues. He and his co-workers call attention to the danger of "deleading" rapidly and the possible storage of this mobilized lead in the central nervous system.

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1. Aub, J. C.; Fairhall, L. T.; Minot, Anne S., and Reznikoff, Paul: Lead Poisoning, Medicine Monographs, Baltimore, Williams & Wilkins Company **7**, 1926.

2. Aub, J. C., and Hunter, Donald: Lead Studies: XV. The Effect of the Parathyroid Hormone on the Excretion of Lead and Calcium in Patients Suffering from Lead Poisoning, Quart. J. Med. **20**: (Jan.) 1927.

3. Kehoe, R. A.; Thamann, Frederick, and Cholak, Jacob: On the Normal Absorption and Excretion of Lead, J. Indust. Hyg. **15**: 257-306 (Sept.) 1933. Kehoe, R. A., and Thamann, Frederick: The Excretion of Lead, J. A. M. A. **92**: 1418 (April 27) 1929.

In 1932 Shelling [4] studied the effect of dietary calcium and phosphorus on the toxicity of lead in the animal. He states that the deposition of calcium phosphate in the course of normal ossification, or the deposition of other insoluble phosphates such as lead, can occur only when the phosphorus intake is adequate for the deposition and for the excretion of the excess cations as the insoluble salts in the feces. On theoretical grounds, he believes, it would seem logical that if the aim in the treatment of lead poisoning is to deposit or excrete the lead in an insoluble or innocuous form, such as the phosphate, an abundance of phosphorus or foods containing phosphorus should be supplied. In his experimental work on rats he showed that the introduction of large amounts of calcium without phosphorus diverts the available phosphorus to rid the body of the excess calcium as the phosphate and thus interferes with the formation of such a compound with lead. Shelling injected colloidal lead phosphate into rabbits and fed them diets very high in calcium or high in phosphorus and the results were in accord with his previous observations; i. e., that the high calcium diets are more toxic than the diets high in phosphorus. As the result of his experimental work, Shelling believes that phosphorus is important in depositing lead in the bones and also in "deleading." "Deleading" may be accomplished by giving a diet low in calcium and relatively high in phosphorus, so that the cations removed from the bones are excreted as the insoluble phosphates. It has also been shown by Bischoff [5] and his co-workers that lead added to serum is less toxic than ordinary lead and that colloidal lead phosphate possesses the same degree of toxicity as lead in serum. Apparently the addition of lead to serum forms a colloidal lead phosphate, which is not as toxic as any other form of lead. The addition of phosphate to the diet and subsequent increase of phosphate in the blood may produce this lead phosphate combination in vivo.

That disturbances of metabolism play an important part in the liberation of lead stored in the system was suggested by Shie,[6] but as early as 1861 Gusserow [7] made the statement that the desirable condition of having lead permanently stored in the bones probably does not exist.

DIETS EMPLOYED (LOW CALCIUM, HIGH PHOSPHORUS)

In some of the cases treated early, the low calcium diet as recommended by Aub and his associates [1] was used, which consists of meat, liver, potato, rice, tomatoes (cooked without milk), canned corn, bananas, apples (peeled), tea, coffee (without milk), butter fat, bread (prepared without milk, such as salt-free nephritic bread or sodium bicarbonate biscuits or crackers), sugar, salt, pepper. In addition, at varying intervals, the patients were given phosphoric acid and ammonium chloride. Catharsis by the use of magnesium sulphate was continued during treatment. Following the report by Shelling [4] of his experimental work a diet was arranged so as to have a low calcium-high phosphorus content, with the ratio 1-3 or 1-4. The vitamin and caloric content is sufficient for daily need. Vitamin D, however, was deficient in the diet and 20 minims of viosterol (250 D) daily was added.

CASES ILLUSTRATIVE OF "DELEADING" IN CHRONIC PLUMBISM

These patients had been exposed to lead absorption over a period of years. Symptoms had been present in this group from six months to two years and had arisen during the period when it was reasonable to assume that lead was being absorbed. A diagnosis of chronic lead poisoning had been made in these individuals and compensation was awarded on the basis of their occupational disease.

The physical examination in all these individuals failed to show any objective evidences indicative of plumbism.

A modification of the method described by Fairhall [8] was used in examining the excreta for lead. All cases were treated and studied under hospital supervision.

CASE 1.—*History.*—S. P., a man, aged 34, had been employed as a painter for thirteen years. In December 1931 he began to complain of abdominal cramps, occasional vomiting and increasing constipation. A diagnosis of lead poisoning was made. He stopped working and has had no exposure to lead since. He came under my observation early in 1933, complaining of weakness, poor appetite, occasional vomiting and constipation.

Examination.—On physical examination he was well developed. Examination was essentially negative. The blood pressure was 126 systolic, 78 diastolic.

In the control series there was no lead present in 1,200 cc. of urine (twenty-four hour specimen) or in 30 Gm. of stool.

The blood showed: red blood cells, 4,350,000; hemoglobin, 86 per cent; platelets, 180,000. The red blood cells were normal in appearance, with no stippling.

Treatment and Results.—The "deleading" treatment consisted of the low calcium diet of Aub and his co-workers, and phosphoric acid, 10 cc., once every hour, for ten doses daily, and magnesium sulphate, one-half ounce (15 Gm.) every morning.

Forty-eight hours after treatment was instituted, daily twenty-four hour specimens of urine showed an average of from 1.4 to 2.6 mg. of lead. At the end of two weeks a trace of lead too small in amount to estimate was obtained. At the end of three weeks, lead could not be detected in the urine.

Amounts varying from 1.5 to 3.2 mg. of lead were found in 50 Gm. of stool. These examinations were made at intervals of forty-eight hours.

Blood chemistry showed normal results: carbon dioxide, 59.4 volumes per cent; calcium, 10.1 mg. per hundred cubic centimeters; phosphorus, 5.0 mg. per hundred cubic centimeters. Repeated blood smear studies showed no stippling of the red blood cells.

Two subsequent examinations after discharge from the hospital showed no lead in the urine.

CASE 2.—*History.*—T. H., a man, aged 56, had been employed as a plumber for the past fifteen years, frequently using lead. For the past four years he had been complaining of generalized weakness, constipation, loss of appetite and gradual loss of weight. A diagnosis of chronic plumbism had been made and, although he had been removed from all exposure to lead during the past three years, he still continued to complain of constipation and weakness and it was alleged that his symptoms were due to lead poisoning.

Examination.—The physical examination showed nothing abnormal. The man was distinctly underweight and had a slight secondary anemia. The blood pressure was 150 systolic, 92 diastolic.

4. Shelling, D. H.: Effect of Dietary Calcium and Phosphorus on Toxicity of Lead in the Rat: Rationale of Phosphate Therapy, Proc. Soc. Exper. Biol. & Med. **30:** 248-254 (Nov.) 1932.

5. Bischoff, Fritz, and Blatherwick, N. R.: Colloidal Lead Phosphate —A Substitute for Colloidal Metallic Lead in Cancer Therapy, J. Pharmacol. & Exper. Therap. **31:** (Sept.) 1927. Bischoff, Fritz; Maxwell, L. C.; Evans, R. D., and Nuzum, F. R.: Studies on the Toxicity of Various Lead Compounds Given Intravenously, J. Pharmacol & Exper. Therap. **34:** (Sept.) 1928.

6. Shie, M. D.: Lead Poisoning: Its Symptomatology and Diagnosis, J. A. M. A. **83:** 580-583 (Aug. 23) 1924.

7. Gusserow, A.: Untersuchungen ueber Bleivergiftung, Virchows Arch. f. path. Anat. **21:** 443, 1861, quoted by Aub et al.[1]

8. Fairhall, L. T.: Lead Studies: 1. The Estimation of Minute Amounts of Lead in Biological Material, J. Indust. Hyg. **4:** 9 (May) 1922.

In the control studies there was no lead in 950 cc. of urine and 0.2 mg. of lead in 62 Gm. of feces. The blood showed: red blood cells, 4,100,000; hemoglobin, 76 per cent. No stippling was seen.

Treatment and Results.—The "deleading" treatment consisted of a low calcium diet, phosphoric acid, 5 cc. once every hour for twelve doses daily in a glass of water, and magnesium sulphate, one-half ounce every morning.

A specimen of urine forty-eight hours after treatment was instituted showed 0.1 mg. of lead present. Subsequent studies every forty-eight hours showed from 0.1 to 1.2 mg. of lead per thousand cubic centimeters of urine. The urine at the end of two weeks showed no lead.

Examination of 50 Gm. of feces showed traces of lead too small to estimate. At the end of two weeks there was no lead present.

The blood chemistry was negative: carbon dioxide, 46 volumes per cent; calcium, 8.4 mg. per hundred cubic centimeters, and phosphorus, 7.7 mg. The red blood cells showed no stippling at any time before, during or after the treatment.

Two subsequent examinations of urine after discharge from the hospital showed no lead.

CASE 3.—*History.*—S. M., a man, aged 45, had been employed for sixteen years as a smelter, constantly using lead. For the past few years he had had increasing constipation, occasional pain in the abdomen and increasing weakness. A diagnosis of chronic lead poisoning had been made about a year prior to his coming under my observation. However, he continued to work and was finally admitted to the hospital because of severe abdominal pain, anorexia with vomiting, marked constipation and general weakness. The abdominal symptoms, particularly the colic, had been getting progressively worse for two weeks prior to admission.

Examination.—The patient was well developed, with a distinct pallor of the face and mucous membranes, a lead line on the gums and poor oral hygiene. The examination was otherwise negative. There was a distinct hypertension, with a systolic blood pressure of 190 and a diastolic of 110.

In the control studies there was a faint trace of lead, too small in amount to estimate, in 1,300 cc. of urine and 1.2 mg. of lead in 50 Gm. of stool. Examination of the blood showed red blood cells, 3,960,000, with hemoglobin, 76 per cent, and moderate stippling.

Treatment and Results.—Treatment for the acute episode was instituted with a high calcium diet and the administration of calcium lactate, 1 drachm (4 Gm.) once every two hours; calcium glucinate, 10 cc., intramuscularly daily for five days, and magnesium sulphate, one-half ounce every morning.

A twenty-four hour examination of urine showed the presence of from 1 to 1.5 mg. of lead (studies made every forty-eight hours). No lead was present at the end of the third week. Repeated examination of 50 Gm. of feces showed from 1 to 2.6 mg. of lead.

Stippling of the blood was seen occasionally on repeated study. After three weeks of treatment with the high calcium therapy (as recommended by Aub and his associates [1]) for the acute toxic episode, the acute symptoms subsided. The blood pressure dropped from a systolic of 190 to 120 and the diastolic from 110 to 80. At the end of three weeks the patient was clinically well, although occasional stippling of the red blood cells was found to be present. A twenty-four hour specimen of urine showed no lead.

A "deleading" treatment was then instituted for a period of three weeks by means of a low calcium diet and the administration of phosphoric acid, 10 cc. every two hours for six doses daily, and magnesium sulphate, one-half ounce, every morning.

Daily examination of a twenty-four hour specimen of urine showed the presence of from 1.5 to 2.6 mg. of lead. Fifty grams of feces, examined three times weekly, showed the presence of from 2.2 to 3.6 mg. of lead. The secondary anemia remained unchanged. Stippling was seen frequently but not in increased amounts.

After three weeks' treatment the patient was discharged from the hospital and was placed on a high calcium diet. He reported weekly to the office. Blood studies showed a rather persistent anemia, with occasional stippling of the red blood cells. A faint trace of lead was present in the urine on three examinations. After one month of rest at home the patient was readmitted to the hospital.

TABLE 1.—*Low Calcium-High Phosphorus Diet (Ratio 1-3)*

Food	Weight, Gm.	Protein	Calcium	Phosphorus	Calories	Vitamin A	Vitamin B	Vitamin C	Vitamin D
Applesauce	100	0.40	0.007	0.012	63.0	++	++	+	—
Grapes	103	1.36	0.019	0.032	100.1	++	+	+	—
Banana	100	1.30	0.009	0.031	99.0	+++	++	++	—
Pineapple juice	540	1.98	0.090	0.144	220.0	++	++	++	—
Shredded wheat (one)	27	3.51	0.011	0.089	100.0	+	+++	—	—
Whole wheat bread	120	11.52	0.024	0.184	298.8	+	+	—	—
Macaroni	30	3.80	0.006	0.041	101.5	—	—	—	—
Egg yolks (four)	80	12.56	0.110	0.419	293.4	+++	++	—	+
Butter	30	0.28	0.004	0.005	217.9	+++	..	—	+
Cream, 40 per cent	70	1.54	0.060	0.047	266.7	+++	++	—	+
Lamb chops	160	27.20	0.020	0.274	569.6	—	+	—	—
Liver	90	17.34	0.015	0.186	109.5	+++	++	?	—
Bacon	15	1.50	0.001	0.016	88.6	—	—	—	—
Baked potato	100	2.20	0.014	0.058	83.0	++	++	+	—
Tomatoes	100	0.90	0.011	0.026	23.0	+++	++	+++	—
Green peas	100	7.00	0.028	0.127	100.0	+++	++	+	—
Mushrooms	60	1.90	0.010	0.062	25.4	—	—	—	—
Celery	30	0.31	0.022	0.010	5.2	—	++	—	—
Almonds	15	3.24	0.037	0.072	100.0	+	++	—	—
Oranges	200	1.60	0.090	0.042	102.78	+	++	+++	—
Lettuce	30	0.34	0.013	0.012	5.40	++	++	+++	..
		101.78	0.601	1.889	2,969.88				

The author is indebted to Miss Emma Baughman, chief dietitian of the Jewish Hospital, who calculated these diets. (From the Laboratory Handbook for Dietetics by Dr. Mary S. Rose.)

Second Admission.—The "deleading" treatment on the second admission consisted of low calcium-high phosphorus diets in ratios of 1-3 and 1-4, phosphoric acid, 5 cc., once every hour for ten doses daily and magnesium sulphate one-half ounce every morning.

Twenty-four hour specimens of urine showed amounts of lead varying from 2.8 to 3.9 mg. At the end of three weeks the urine still showed, on an average, 1.5 mg. of lead in a twenty-four hour specimen. Fifty grams of stool, examined three times weekly, showed the presence of from 2.6 to 4.2 mg. of lead. Chemical examination of the blood was negative; calcium, 10.6 mg. per hundred cubic centimeters; phosphorus, 8.8 mg., and carbon dioxide, 57.4 volumes per cent. The blood pressure was from 118 to 130 systolic and from 70 to 82 diastolic.

During the period of the "deleading" treatment there was no return of any of the acute symptoms. The patient was discharged and placed on a high calcium diet. He did not return to work but was kept under observation. Repeated examinations of twenty-four hour specimens of urine showed faint traces of lead. At the end of three weeks no lead was present. The patient continued, however, to complain of weak-

ness and was treated for the secondary anemia. Occasional stippling of the red blood cells was noted. He was kept under observation for six weeks and then again admitted to the hospital.

Third Admission.—The "deleading" treatment on the third admission consisted of a low calcium-high phosphorus diet in the ratio of 1-4 (3,000 calories) and phosphoric acid, 10 cc. every hour for ten doses daily, viosterol (250 D), 5 mm. every four hours, and magnesium sulphate, one-half ounce every morning.

A twenty-four hour specimen of urine showed amounts of lead varying from 1.8 to 2.7 mg. Fifty grams of feces examined three times weekly showed from 2 to 3.2 mg. of lead. Examination of the blood showed: red blood cells, 4,350,000 and hemoglobin 82 per cent. Occasional stippling of the red blood cells was seen.

After four weeks of the "deleading" treatment the patient was discharged. There were no subjective symptoms other than slight weakness. Subsequent studies continued to show small traces of lead in the urine with occasional stippling of the red blood cells. The patient will probably be hospitalized again for further "deleading" treatment.

These three case reports are illustrative of a group of nine individuals who were under observation and treatment for chronic plumbism. Six of these patients had been exposed to the ingestion of lead for several years and had come under observation from six months to two years after a diagnosis had been made. It is reasonable to state, in view of the work of Kehoe and his associates,[3] that there had been a gradual excretion of lead during this period. In these patients, as illustrated in cases 1 and 2, "deleading" for a short period of time was sufficient to show that they were not heavily "leaded." By virtue of the fact that no lead was found in the urine at the end of three weeks' treatment it could be implied that there was only a small amount of lead stored in the depots of the body. In the absence of any objective evidence of lead poisoning and in view of the laboratory examinations it was reasonable to assume that a diagnosis of chronic lead poisoning was not justified in these individuals. In the remaining three of this group, as illustrated by case 3, it was evident that a great deal of lead had been absorbed and was stored in the tissues. It was necessary to hospitalize these patients repeatedly in order to institute the "deleading." Arbitrarily from three to four weeks was set as a time limit for the active "deleading" treatment. Although no acute toxic episodes occurred in any of the patients, nevertheless I was cognizant of the danger of an active lead stream and a possible involvement of the central nervous system. The danger of active "deleading" was pointed out by Hegler,[9] and also by Kehoe and his co-workers. Spinal fluid examinations were not done in any of the patients. In the studies by Rabinowitch and his co-workers,[10] lead was found in the cerebrospinal fluid of persons known to be suffering from lead poisoning. Lead was also found occasionally in small amounts in patients not unduly exposed to the metal. More recently Cone and his associates[11] discussed the question of lead as a possible cause of multiple sclerosis. In my studies there was no indication that an active lead stream was responsible for an increase in subjective symptoms or the appearance of symptoms suggesting the involvement of the peripheral or central nervous system. It is reasonable to assume that during the process of "deleading" the lead stream is probably not as strong as during the period of absorption, when the individual is exposed.

TABLE 2.—*Low Calcium-High Phosphorus Diet (Ratio 1-4)*

Food	Weight, Gm.	Protein	Calcium	Phosphorus	Calories	Vitamin A	Vitamin B	Vitamin C	Vitamin D
Dried prunes	60	1.2	0.030	0.060	171.00	++	++	—	—
Fresh pineapple	90	0.33	0.015	0.024	36.00	++	++	++	—
Fresh grapes	90	0.74	0.010	0.018	81.90	++	+	+	—
Pineapple juice	540	1.08	0.090	0.144	220.00	++	++	++	—
Fresh lima beans	81	5.76	0.023	0.108	100.00	+	+++	+	—
Stewed corn	99	3.06	0.006	0.102	100.00	+	++	+	—
Mushrooms	60	1.90	0.010	0.062	25.40	..	..	..	..
Fresh green peas	100	7.00	0.028	0.127	100.00	+++	++	+	—
Baked potatoes	240	3.28	0.032	0.138	200.00	++	++	+	—
Tomatoes	90	0.80	0.009	0.021	19.00	+++	++	+++	—
Tomato juice	90	0.78	0.009	0.021	19.00	+++	++	+++	—
Whole wheat bread	140	13.44	0.028	0.214	348.60	+	+	..	..
Rice	15	1.13	0.002	0.014	49.70	—	—	—	—
Shredded wheat	27	3.51	0.011	0.089	100.00	+	+++	—	—
Butter	30	0.28	0.004	0.005	217.40	+++	..	—	+
Cream, 40 per cent	60	1.24	0.048	0.038	216.00	+++	++	—	..
Egg yolks (six)	120	17.80	0.156	0.506	410.80	+++	++	—	+
Bacon (six half slices)	32	3.36	0.002	0.036	200.00	—	—	—	—
Lamb	150	27.20	0.015	0.259	319.50	—	+	—	—
Halibut	100	16.27	0.017	0.187	67.90	—	+	—	—
Cocoa	5	1.08	0.005	0.035	24.80	—	—	—	—
Peanuts	18	4.68	0.013	0.073	100.00	+	++	..	..
		116.30	0.536	2.407	3,127.50				

From the experimental data of Aub and his associates,[1] one may conclude that complete "deleading" is not possible. However, with the low calcium and the high phosphorus therapy and the administration of either ammonium chloride or phosphoric acid, there is a means of estimating whether or not large amounts of lead have been absorbed and stored in the tissues and also a means of rapidly "deleading" individuals.

CASES ILLUSTRATIVE OF "DELEADING" IN SUBACUTE PLUMBISM

CASE 4.—*History.*—M. S., a woman, aged 25, had been soldering wires using lead for approximately six months, when she began to complain of occasional abdominal pain and general weakness. A diagnosis of subacute plumbism was made on the history of exposure and the presence of occasional stippling of the red blood cells.

Examination.—On physical examination the patient was in poor general condition with a distinct secondary anemia; otherwise the examination was negative.

9. Hegler, C.: Treatment of Poisoning Caused by Heavy Metals, Deutsche med. Wchnschr. **59:** 570 (April 14) 1933.

10. Rabinowitch, I. M.; Dingwall, Andrew, and Mackay, F. H.: Studies on Cerebrospinal Fluid: 1. Chemical and Spectographic Detection of Lead, J. Biol. Chem. **103:** 707 (Dec.) 1933.

11. Cone, William; Russell, C., and Harwood, R. U.: Lead as a Possible Cause of Multiple Sclerosis, Arch. Neurol. & Psychiat. **31:** 236-269 (Feb.) 1934.

Control studies showed no lead present in a twenty-four hour specimen (950 cc.) of urine, a faint trace of lead present in 20 Gm. of stool, and a blood count of red blood cells, 3,800,000, hemoglobin, 74 per cent, and platelets, 108,000. There was occasional stippling of the red blood cells.

Treatment and Results.—"Deleading" treatment consisted of a low calcium diet and ammonium chloride, 15 grains (1 Gm.) every hour for ten doses daily, and magnesium sulphate, one tablespoonful every morning.

Examination of the urine forty-eight hours after treatment was instituted showed a trace of lead present. Subsequent examinations showed approximately 0.9 mg. of lead in a twenty-four hour specimen. After two weeks of treatment, no lead could be found. Subsequent studies were negative for lead.

There was a faint trace of lead in the feces forty-eight hours after treatment was instituted. At the end of two weeks, no lead was present. Subsequent studies at no time showed the presence of lead.

There was no stippling of the red blood cells on discharge from the hospital.

CASE 5.—*History.*—F. C., a man, aged 31, had been employed as a painter at intervals during the past year and a half, at which time he began to complain of occasional abdominal pain and constipation. A blood study had been done and a few stippled red blood cells were found. A diagnosis of lead poisoning had been made on this finding and on the suggestive clinical symptoms.

Examination.—Physical examination was essentially negative. Control studies showed no lead present in a twenty-four hour specimen (1,400 cc.) of urine and no lead present in 30 Gm. of stool. The red blood cells numbered 4,800,000, with hemoglobin 92 per cent. Occasional stippling of the red blood cells was noted.

Treatment and Results.—The "deleading" treatment consisted of a low calcium-high phosphorus (ratio 1-4) diet and sodium phosphate, 4 Gm. daily, and magnesium sulphate one-half ounce every morning.

Forty-eight hours after treatment was instituted, a trace of lead (too small to estimate) was found in the urine. At the end of ten days, after repeated studies, no lead was found. In the feces, 0.5 mg. of lead was present in 50 Gm. of stool. At the end of ten days no lead was present. No stippling of the red blood cells was seen.

There were four patients in this group in whom a diagnosis of subacute lead poisoning had been made. Exposure to the absorption of lead was for a comparatively short time (from two to six months), at which time when subjective symptoms and the finding of stippling of the red blood cells suggested the diagnosis of lead poisoning. Cases 4 and 5 are illustrative of the value of the "deleading" treatment in this type of case. Within two weeks the lead that had been absorbed was excreted and subsequent studies after discharge from the hospital failed to reveal the presence of any lead in the urine. In evaluating the results of "deleading" in this group it is important to keep in mind that these individuals had been removed from their occupation. Subjective symptoms would probably have disappeared gradually with the excretion of the metal; under treatment, however, a more rapid "recovery" followed.

"DELEADING" AS A DIAGNOSTIC PROCEDURE

CASE 6.—*History.*—R. G., a man, aged 56, had been employed as a compositor handling lead for almost forty years. At no time was there any history of an acute toxic episode. He began to complain of headaches, dizziness, occasional abdominal pain and diarrhea two weeks before admission to the hospital. A diagnosis of lead poisoning was made, based chiefly on his occupation.

Examination.—On physical examination the patient was well developed and well nourished. There were no objective signs of lead poisoning present. Muscular power was good. Neurologic examination was negative.

Examination of the urine in control studies showed no lead present in a twenty-four hour specimen (1,200 cc.), and no lead was present in 50 Gm. of feces. The red blood cells numbered 4,820,000, with hemoglobin 90 per cent. The red blood cells were normal in appearance, no stippling being seen at any time.

Treatment and Results.—The "deleading" treatment consisted of low calcium-high phosphorus diet in the ratio of 1-3 (2,600 calories) and sodium phosphate, from 3 to 5 Gm. daily, and magnesium sulphate, one-half ounce every morning.

A twenty-four hour output of urine on repeated examination failed to show the presence of any lead. Examination of the feces every forty-eight hours failed to show the presence of lead.

As a diagnostic procedure, "deleading" may occasionally prove helpful. Two patients constituted this group and it was alleged that lead poisoning was responsible for the symptomatology. The diagnosis in both cases rested entirely on the history of occupation. The changes after "deleading" indicated that abnormal amounts of lead had not been absorbed. The value of this method as a means of diagnosis lies in the fact that one can determine whether or not abnormal amounts of lead are stored in the tissues. The exhaustive investigations of Kehoe and his co-workers [3] showed that the normal adult American excretes lead at a rate of from 0.02 to 0.08 mg. per liter of urine and at a rate of 0.03 to 0.1 mg. per gram of ash in the feces. The mean daily output for various groups of normal individuals varies from 0.25 to 0.38 mg.

The finding of an abnormal amount of lead in this type of case does not necessarily mean that the lead is the responsible agent in producing the clinical symptoms. The finding of lead below the amount normally present, or the absence of lead, is the important factor in excluding this heavy metal as the agent responsible for the symptoms.

COMMENT

The administration of a diet low in calcium and the addition of either ammonium chloride or phosphoric acid definitely causes an increased excretion of lead. The addition of a diet high in phosphorus [4] aids in the excretion of the lead. In several cases of chronic plumbism the lead in both the urine and the feces was increased in amount after phosphate therapy was instituted. Experimental and practical experience bears out Shelling's opinion. The addition of a high phosphorus, high calory diet with sufficient vitamin content improved the general appearance; the nutritional requirements were adequate and the rate of excretion of lead was maintained. In the "deleading" treatment of our patients there is now being used the low calcium, high phosphorus diet with a ratio of 1-3 and 1-4 as already outlined.

In persons who have absorbed lead it is possible that waves of liberation occur from time to time and produce symptoms of clinical activity. This method of treatment presents a means of rapidly ridding the body of the lead that can be readily mobilized. Oliver,[12] who has had large experience, reports the finding of lead in the urine many years after the exposure has ceased. Metabolic or some other factors not yet thoroughly understood may be responsible for these occasional waves of lead excretion. The lead that has been absorbed and is released at certain periods can be much more rapidly

12. Oliver, T.: Lead Poisoning, London and New York, 1914.

excreted at stated intervals with this type of treatment. Although complete "deleading" is not possible, as demonstrated experimentally,[1] nevertheless it is reasonable to assume that the lead excreted is a large fraction of the lead that has been absorbed. The "deleading" treatment may have to be repeated at intervals if there is evidence of continued excretion of abnormal amounts of lead.

It is advisable that all patients undergoing "deleading" treatment be hospitalized. Although I have observed no instance of an acute toxic episode arising during the course of treatment, such an occurrence is possible and strict supervision is therefore necessary. The failure of acute toxic symptoms to develop when there is increased lead excretion is further proof of the fact that there is no parallel between the absorption and excretion of lead and the toxic manifestations. The estimation of lead in the excreta is of aid only in proving whether or not abnormal amounts of lead have been absorbed. The "deleading" treatment furnishes a method whereby lead can be rapidly removed from the tissues. The period both of disability and of prolonged excretion can be definitely shortened.

SUMMARY

The "deleading" treatment definitely increases the rate of excretion of lead. In chronic lead poisoning it may be necessary to "delead" the patients at intervals if the rate of excretion indicates a marked degree of absorption. In subacute plumbism the treatment usually brings about a rapid recovery. The natural process of excretion is hastened and the period of disability is definitely shortened. The "deleading" process may be used as an aid in the differential diagnosis in individuals suspected of having lead poisoning. The absence of lead in the excreta or the presence of amounts that may be considered normal [3] excludes lead as a factor. The presence of lead in the excreta in amounts above normal is an indication of previous absorption but does not necessarily prove that the individual is suffering from lead poisoning.

As a result of my experiences, I am in agreement with Kehoe and his co-workers [3] when they state that "the diagnosis of lead intoxication must continue to rest largely upon the skill and judgment in the elicitation and interpretation of clinical evidence."

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Body Fat and Surplus Fuel.—All body fat originates as surplus fuel. The body gains fat when, and because, it takes in more fuel than it burns. Any food which has any fuel value is fattening when added to a dietary which is already sufficient. And foods are fattening just about in proportion to their fuel values; for, as we saw in the last chapter, surplus calories whether taken as carbohydrate, fat or protein in the food tend to be stored chiefly as fat in the body. The largest amount of surplus fuel which the body will store as carbohydrates (chiefly glycogen in the muscles and liver) is only enough to yield about 1,500 calories, while each pound of body fat means approximately 4,000 stored calories. In many cases the body if persistently supplied with more food than it needs will store more and more fat to an almost unlimited extent. While fashion largely determines what degree of fatness is popularly regarded as an asset and what as a liability, yet we know from good medical evidence that the problem of optimal fatness is one of health as well as style. A moderate amount of fat is undoubtedly of benefit to the body, while quite as certainly too large a surplus is a burden and may become a danger.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934, page 38.

CONTROL OF LEAD POISONING IN THE WORKER

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Because of the inability of engineering to eliminate lead exposure at its source, the scientifically proved method of control by Aub and his associates has been applied to lead absorption and its acute toxic episodes in the supervision and treatment of approximateiy 500 cases of lead exposure, 200 of absorption, and 100 of intoxication.

The present demonstration of these principles has been effected by a diagnostic division of cases into absorption (1) plus severe intoxication requiring hospitalization, (2) plus mild intoxication, not disabling, (3) plus only laboratory signs of intoxication, and (4) without even laboratory signs of latent intoxication.

Except for the first actually disabled group, the other three potentially disabled groups have been treated with the worker at work. Such treatment must (1) start before disability, (2) utilize calcium advisedly but not as a routine, and (3) consider under perfect laboratory and clinical control that artificial deleading is superior to spontaneous uncontrolled deleading.

Following my study and treatment of a few cases of lead poisoning, published five years ago [1] and based on the work of Aub and his co-workers,[2] I was asked in October 1930 to make a survey of a storage battery plant and to make recommendations to the officials concerning the lead hazard. At first I considered it a housecleaning job in which I had the usual problem of remedying what damage had already been done. That my survey should develop into a problem of controlling lead poisoning, a matter of prevention and in my own field of internal medicine, was beyond my hope. I still see no reason to discard any of the principles of treatment laid down by Aub and since further elaborated by him,[3] although I have enlarged my experience to include about 500 cases of lead exposure, more than 200 cases of considerable lead absorption, and more than 100 cases of lead intoxication in various industries, besides this personal supervision of a group of workers in a storage battery plant. I am now convinced that these principles may even be applied as the basis for a practical control of lead poisoning.

Whether I am justified in considering this a successful solution may be judged by the following:

1. The initial study showed this to be a distinctly better than average battery plant, employing at any one time about 100 workers, exposed to considerable lead oxide inhalation in spite of relatively good engineering precautions.

2. There were six cases of real lead intoxication causing disability with compensation arising in my first three months of service. Previous to my survey of

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Belknap, E. L.: Lead Poisoning: The Diagnosis and Treatment of Its Most Common Toxic Episode, Lead Colic, Wisconsin M. J. **28**:346-350 (Aug.) 1929.

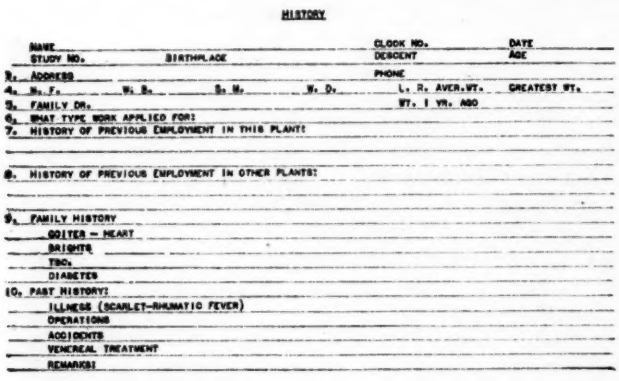
2. Aub, J. C.; Fairhall, L. T.; Minot, Anne S., and Reznikoff, Paul: Lead Poisoning, Baltimore, Williams & Wilkins Company, 1926.

3. (*a*) Aub, J. C.; Robb, G. P., and Rossmeisl, Elsie: Lead Studies: XVII. The Significance of Bone Trabeculae in the Treatment of Lead Poisoning, Am. J. Pub. Health **22**: 825-830 (Aug.) 1932. (*b*) Aub, J. C.: Contribution on Lead Poisoning, in Cecil, R. L.: Textbook of Medicine, Philadelphia, W. B. Saunders Company, 1934, pp. 559-564. (*c*) Hunter, Donald, and Aub, J. C.: Lead Studies: XV. The Effect of the Parathyroid Hormone on the Excretion of Lead and of Calcium in Patients Suffering from Lead Poisoning, Quart. J. Med. **20**: 123-140 (Jan.) 1927.

this plant I am told that there were about eighteen or twenty cases of lead poisoning on compensation annually.

This is at least the equivalent of the annual rate of 15.9 per hundred for compensation of plumbism cases in a group of storage battery workers studied by the U. S. Public Health Service.[4]

3. There are now one or two cases of disability a year in the 100 workers. In fact, in contrast to the six cases arising in my first three months, and credit



HISTORY

NAME — CLOCK NO. — DATE
STUDY NO. — BIRTHPLACE — DESCENT — AGE
2. ADDRESS — PHONE
4. M. F. W. S. S. M. W. D. L. R. AVER. WT. GREATEST WT.
5. FAMILY DR. WT. 1 YR. AGO
6. WHAT TYPE WORK APPLIED FOR?
7. HISTORY OF PREVIOUS EMPLOYMENT IN THIS PLANT?
8. HISTORY OF PREVIOUS EMPLOYMENT IN OTHER PLANTS?
9. FAMILY HISTORY
GOITER — HEART
BRIGHT'S
TBC.
DIABETES
10. PAST HISTORY?
ILLNESS (SCARLET-RHUMATIC FEVER)
OPERATIONS
ACCIDENTS
VENEREAL TREATMENT
REMARKS?

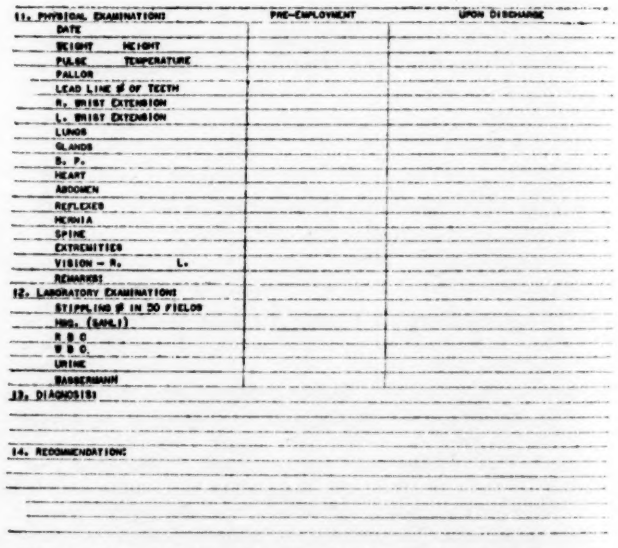
Fig. 1.—Form used in making examination previous to employment.

should here be given to the generous cooperation of the officials of the company, there have been only four other cases of lead intoxication severe enough to warrant actual compensation for disability in the past three and a half years. No new case has developed in the last eight months, although the lead exposure has not been entirely eliminated and in some instances has been actually increased. I now feel confident that the number of workers heavily leaded has been reduced close to a minimum by treatment and increasing but not yet perfected engineering protection. It does not seem unreasonable to expect to reach the goal of complete prevention.

A successful working technic for the control of lead poisoning remains a problem for the internist. It cannot be a matter of secondary consideration in the mind of the average industrial traumatic surgeon or reducible to a formula which a plant superintendent or a lay personnel officer can manipulate. It is not so simple as waiting until a case of lead poisoning can be diagnosed across the room because of the patient's peculiar pallor. Neither is it so simple as discharging a worker to swell the ranks of disabled veterans and county institution inmates, or even to farm them out to other industries. It surely is not so simple as hospitalizing a man for weeks for exhaustive research. In my state a man who has been unable to work for three days because of occupational disability is automatically entitled to 70 per cent compensation and necessary medical expense. The actual title of this paper should therefore be The Control of Lead Poisoning in the Worker Actually at Work.

The first precaution in our method of control is a stringent preemployment examination by the physician himself (fig. 1). The family history is unusually important, since individuals with a constitutional defect of early degenerative cardiovascular disease, diabetes, thyroid or other endocrine dyscrasia are not good candidates for lead workers. The past history must be thoroughly investigated for indications of chronic infections such as tuberculosis and syphilis. A very important feature of this preemployment history is a detailed and complete recapitulation of the previous occupational record to rule out men who have already absorbed lead from other sources. Besides the common sources, such as painting and large storage battery plants, other sources include the following occupations: farming, if lead arsenate is used; molding, sawing and grinding of brass and, especially, the small battery repair stores where dry pasted plates may be inserted to renovate old batteries and junk shops where old batteries are pounded up and salvaged without any engineering or medical supervision Even the best intentioned industry cannot be expected to shoulder the responsibility of labor material already loaded with lead because of the laxity or ignorance of some other employer.

The preemployment survey must of course include a very complete physical examination (fig. 2). The lead line in the gums is the most obvious feature to look for. Unfortunately, many family physicians are unfamiliar with it and are likely to regard any gum discoloration as a "suggestive lead line." Although its intensity may vary, this is one finding of which one can say absolutely that it either is or is not present. With the aid of proper illumination and a lens, one can make no mistake in determining the presence of the characteristic line of dots in the gum near teeth which are carious or surrounded by active pyorrhea. I have found that the lead line usually appears when the stipple cell count is from 10 to 20 for fifty fields (from 1,000 to 2,000 per million red blood cells). The exact technic for the gum examination has been well described by Aub.[3b] It is amusing to hear some industrial surgeons



11. PHYSICAL EXAMINATION? — PRE-EMPLOYMENT — UPON DISCHARGE
DATE
WEIGHT HEIGHT
PULSE TEMPERATURE
PALLOR
LEAD LINE ⊕ OF TEETH
R. WRIST EXTENSION
L. WRIST EXTENSION
LUNGS
GLANDS
B. P.
HEART
ABDOMEN
REFLEXES
HERNIA
SPINE
EXTREMITIES
VISION — R. L.
REMARKS?
12. LABORATORY EXAMINATION?
STIPPLING ⊕ IN 50 FIELDS
HBG. (SAHLI)
R B C
W B C
URINE
WASSERMANN
13. DIAGNOSIS?
14. RECOMMENDATIONS

Fig. 2.—Form used in making examination previous to employment.

still proclaim that one of their main methods for the prevention of lead poisoning is strict attention to dental hygiene. The fact is that poor oral hygiene merely serves as a very convenient though not desirable indicator of lead absorption. As a rough test for an emergency diagnosis, I am convinced that the absence of a lead line in a pyorrheal gum indicates that there is very little, if any, free lead circulating. I have seen this borne out by quantitative twenty-four hour urine

4. Lead Poisoning in a Storage Battery Plant, Pub. Health Bull. 205, June, 1933.

examinations for lead. But, on the other hand, in a mouth free of caries or pyorrhea, the absence of a lead line does not rule out lead absorption or lead intoxication. I have seen a man with no lead line whatever who had a stipple cell count of 400 in fifty fields with an abnormal amount of lead in the urine and severe lead colic. Strict attention to oral hygiene in this case did

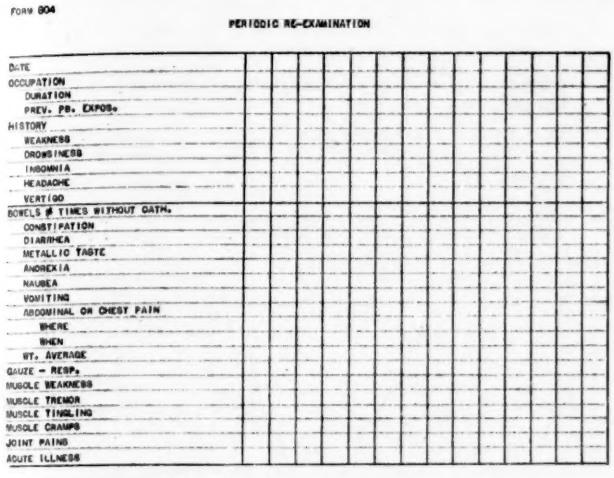


Fig. 3.—Form used in making periodic reexamination of workers.

not prevent acute lead poisoning. Again, it is not so simple as that.

The preemployment examination is not complete without adequate laboratory studies: blood Wassermann test, routine urine examination, complete blood count, and a rigorous search for stippled red cells. I happen to find it convenient to use the Wright stain on a cover slip smear, recording the number of stipple cells seen in fifty oil immersion fields (to get the equivalent number of stipple cells per million red blood cells, mul-

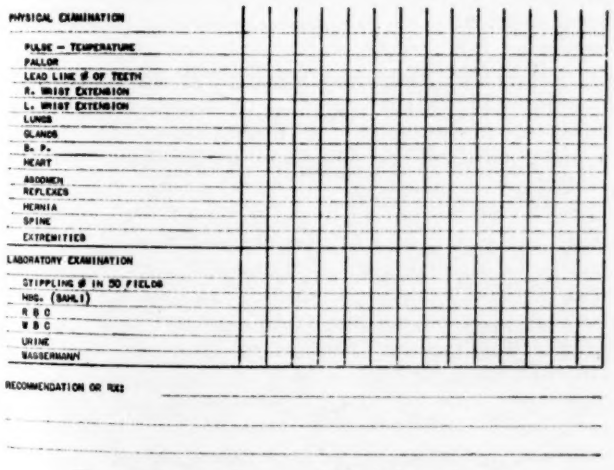


Fig. 4.—Form used to record physical examinations.

tiply by 100, taking the usual number of 200 red cells per microscopic field). In doubtful cases a twenty-four hour urine may be examined quantitatively for lead.

After a personnel of excellent physical quality has been developed as a result of these stringent preemployment examinations, the next precautionary step in the control is that of periodic reexaminations at least every two weeks to three months, according to the intensity of exposure. I have found the form shown in figure 3 practical. It includes symptoms grouped according to the three most important systems involved: nervous, gastro-intestinal and extremities, besides certain essential physical observations (fig. 4): weight, presence of lead line, strength of extensors, and blood pressure, with space for other physical manifestations as indicated by individual complaints.

It is of vital importance that the physician give the reexamination history himself so that he may establish and continue a close personal relationship with the worker in order that the latter may confidently tell the doctor of his slightest physical discomfort. It is only in this way that one can discover and give prompt treatment not only to incipient lead intoxication but to the apparently mild intercurrent illness that may precipitate

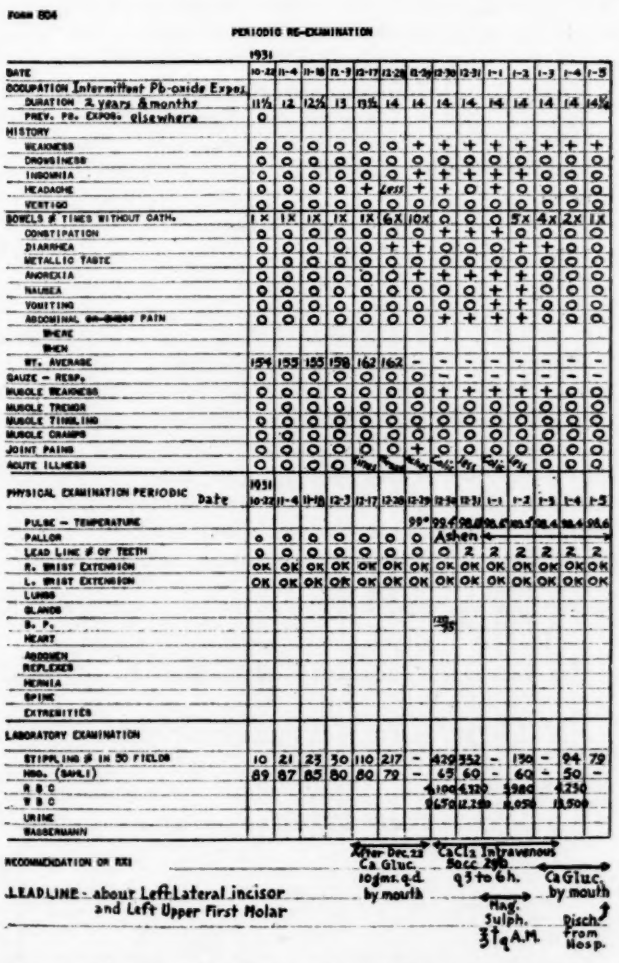


Fig. 5 (case 1).—This is typical of the periodic reexamination form in use. There was no lead line and a slowly rising stipple cell curve after an exposure of about three years. Suddenly the stipple cell curve mounted with the onset of an infection of the upper respiratory tract and subsequent intestinal influenza. Complete disability with sudden acute lead colic developed within a week. This was an earlier case, when I was using calcium only by mouth when giving treatment at the factory. At present, before the worker is disabled and while he is still able to work, I should give intravenous calcium once or twice a day as soon as the stipple cell counts show a steady increase above 30. Acute symptoms were entirely relieved in three days by intensive hospital treatment, including intravenous calcium. The patient left the hospital seven days after the onset of the acute lead colic and returned to work in about six weeks He has remained at work, where there is still occasional exposure, without any symptoms for the last two years.

a serious toxic episode due to a shift in the acid base balance.

Included in these frequent periodic reexaminations there must be a record of laboratory studies. Complete blood counts and routine urine tests as well as an estimation of lead in the twenty-four hour urine should be done at least every six months, and oftener in selected cases. Such quantitative estimation of lead in the urine may bring surprising information as to the amount of

absorption, even in the so-called insusceptible individuals. The method of Fairhall, with modifications noted in the U. S. Public Health Bulletin,[5] has proved satisfactory as used by our chemist. According to the work of Dr. Kehoe,[6] the so-called normal amount of lead in the twenty-four hour urine of a worker who does not work with lead may be 0.08 mg., and even 0.15 mg. may be a sign of nothing more than the expected absorption that may be safely permitted in a lead worker.[7] I have found this limit of 0.15 mg. to be safe and also that anything above 0.2 mg. should be considered abnormal and requiring investigation.

Whenever a man is reexamined, a hemoglobin and a stipple cell count must always be made. I pay most attention to the stipple cell count, because, if one waits for a real anemia with hemoglobin below 80 per cent or red blood cells below four million, the patient may be on the verge of an acute episode such as lead colic, which can then hardly be avoided. The presence of a few stipple cells (from 5 to 10) in fifty fields (from 500 to 1,000 stipple cells per million red blood cells) does not necessarily indicate anything more than lead absorption. A man may continue for years with such a count without lead intoxication or acute lead poisoning. But if the stipple cell count leaps up from day to day, 20, 50, 100, 200, 400 in fifty fields, an acute episode is impending that may still be prevented. This episode is not due necessarily to any added exposure but most often to an infection disturbing the acid base equilibrium with resultant increased circulating lead. In my own experience it has been an acute infection that has precipitated every spontaneous episode of acute lead intoxication. It is at seasons when infections of the upper respiratory tract are prevalent that one must be most watchful. As I have said before, the early discovery and treatment of even the most apparently insignificant infection is one of the most important methods of control.

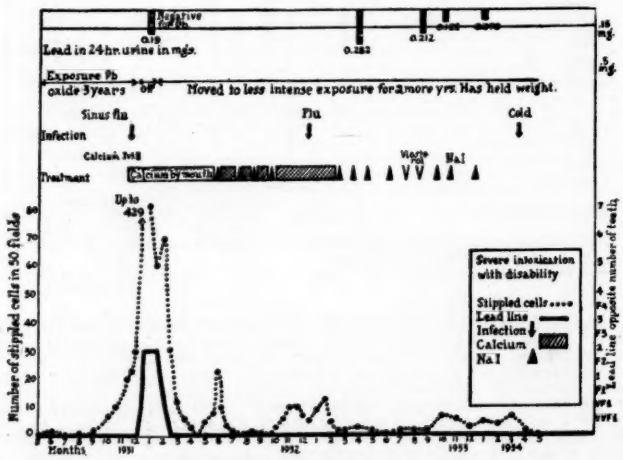


Fig. 6 (case 1).—This type of severe intoxication with disability is shown graphically by a chart which includes the subsequent courses of deleading, and the final decrease of lead in twenty-four hour urine to below the safe limit of 0.15 mg.

The results on the periodic examination must be analyzed frequently by the medical consultant so that treatment may be changed immediately, if necessary, and recommendations made for further precautions against exposure. It is advisable that the physician insist on the proper wash room and lunch room hygiene and that he suggest milk between meals; but it is more important that he himself keep the closest supervision of his men at their actual work stations so that he may visualize the exposure of each when he examines him later in the medical department. He must also be on

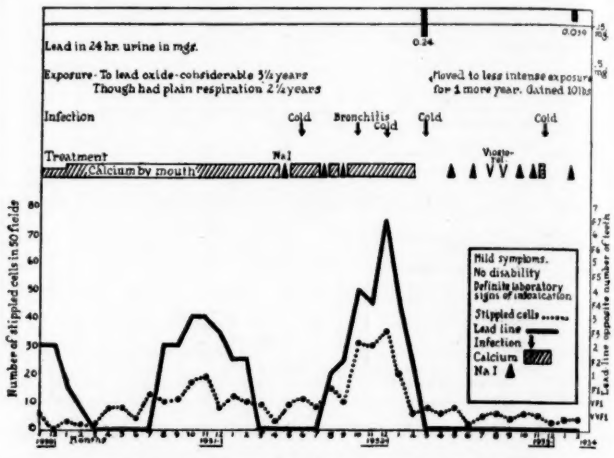


Fig. 7 (case 2).—This illustrates the second type with mild symptoms of weakness, vague abdominal distress, and loss of weight but no real disability, but with definite laboratory signs of intoxication, treated in the usual manner with calcium and iodide therapy. The man was exposed for three and one-half years to heavy lead inhalation but used a plain respirator for two and a half years of this time. It shows a recurrence of lead line and stipple cells following first courses of deleading coupled with infection, but he has passed through several bouts of infection since, without stirring up signs of lead intoxication. He showed decided improvement a month before he was moved to less intense exposure. He has had no recurrence of symptoms or signs for the past year, he has gained 10 pounds (4.5 Kg.), and his twenty-four hour urine is well below 0.15 mg., even though he is still exposed to moderate but definite lead absorption.

the alert for unexpected sources of exposure by frequent and unannounced inspection of the plant itself, so that he may be sure that adequate suction devices are being used where needed and that men have been shifted to less hazardous positions or given increased respirator protection according to his recommendations. Such broad measures for protection of the worker against industrial poisoning agree, I believe, with the principles so succinctly epitomized in the recent monograph by Hamilton.[8] The result of my analysis of this plant inspection and of the periodic monthly medical report has proved to me, for example, that equipping a man with a positive pressure or air line respirator is equivalent to moving him from exposure to lead. This greatly simplifies but does not do away with the necessity of treatment, for I have seen many men whose lead exposure antedated the development of this protection.

The actual treatment of lead absorption and intoxication, I find, concerns itself with four types of patients. The first type (figs. 5 and 6), which is now becoming rare but which was considered inevitable until recently, is that of the worker with heavy absorption plus a real intoxication with temporary disability from colic, palsy, or even encephalopathy. The treatment for this is still the one based on Aub's research and described in my earlier paper, but with certain practical modifications, such as:

1. Immediate hospitalization with intravenous calcium gluconate, instead of chloride, 50 cc. of the 5 per cent solution

5. The Use of Tetra-Ethyl Lead Gasoline in Its Relation to Public Health, Pub. Health Bull. 163, June 1926, pp. 23-27.

6. Kehoe, R. A.; Thamann, Frederick, and Cholak, Jacob: On the Normal Absorption and Excretion of Lead: II. In Modern American Life, J. Indust. Hyg. **15**: 273-287 (Sept.) 1933.

7. Kehoe, R. A.; Thamann, Frederick, and Cholak, Jacob: Lead Absorption and Excretion in Certain Lead Trades, J. Indust. Hyg. **15**: 306-319 (Sept.) 1933.

8. Hamilton, Alice: Industrial Toxicology, New York, Harper & Bros., 1934.

every three or four hours for the first twenty-four to forty-eight hours and three to four times a day for the next two to four days, and 5 Gm. of plain, powdered, calcium gluconate in milk three times a day after meals.

2. Also dextrose and saline solution intravenously if there has been dehydration or serious acute infection. With such treatment men may leave the hospital in one or two weeks and return to work in three or four more weeks.

The next type (fig. 7) is more frequent, although it is becoming less so. It includes men with mild symptoms; i. e., slight loss of appetite, beginning constipation and fleeting abdominal distress without real disability. They may or may not show a lead line but will have laboratory evidence of absorption plus intoxication; i. e., a rather rapidly rising "stipple curve" (from 20 to 100 cells in fifty fields or from 2,000 to 10,000 per million red blood cells) and from 0.2 to 0.6 mg. of lead in the twenty-four hour urine. Treatment is given while the worker remains at work and consists of intensive calcium intake by mouth and vein, and, if possible, removal from exposure by change of the work station or just as efficiently by use of the positive pressure respirator at the original work station. My use of calcium is now chiefly as a temporary emergency measure until the worker can be removed from exposure. I never use it as a routine.

The third type (fig. 8) may show only a lead line, with laboratory signs of lead absorption and intoxication. This is long before there are any symptoms at all. The treatment is identical with the one just described. This group is named here because it is remarkable that there should be such unmistakable warnings of intoxication discoverable only by the laboratory without any premonitory symptoms and yet be so susceptible to prompt treatment, preventive of any disability even in the face of continued exposure.

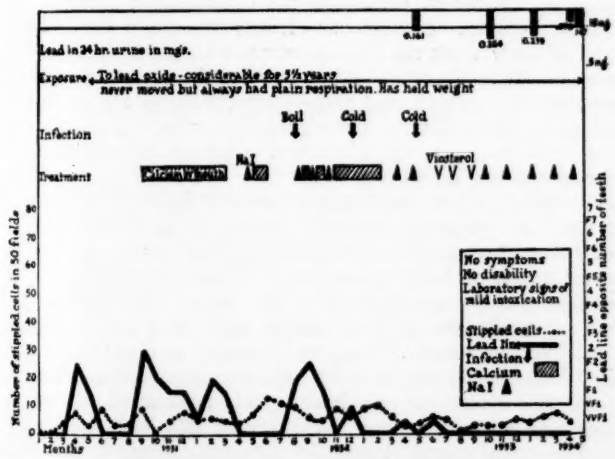


Fig. 8 (case 3).—This illustrates the third type of worker with no symptoms at all, no disability and only laboratory signs of mild intoxication complicating lead absorption, the latter indicated in this case by a lead line. The man has been exposed to considerable lead oxide for three and one-half years but has always used a plain respirator. With continued and even increased exposure, the lead line has disappeared following calcium treatment while at work, to reappear again with the first deleading, and finally to disappear altogether, paralleling the reduction of lead in the twenty-four hour urine to 0.15 mg.

The fourth type (fig. 9) consists of the so-called good risks, of workers who have no signs of absorption, not a clinical symptom and not even apparent laboratory signs of latent intoxication but who, I have found, may show stored lead if given provocative treatment with iodide or some other deleading agent.

With facilities for perfectly controlled conditions in laboratory and clinical examinations I now believe that it is safer to liberate stored lead at a time when this careful supervision is possible than to let nature delead the individual spontaneously by means of the acidosis of infection. Uncontrolled, this natural liberation of lead may result in an overwhelming and untimely intoxication. Controlled or artificial deleading together with as much reduction of exposure as possible seems to me

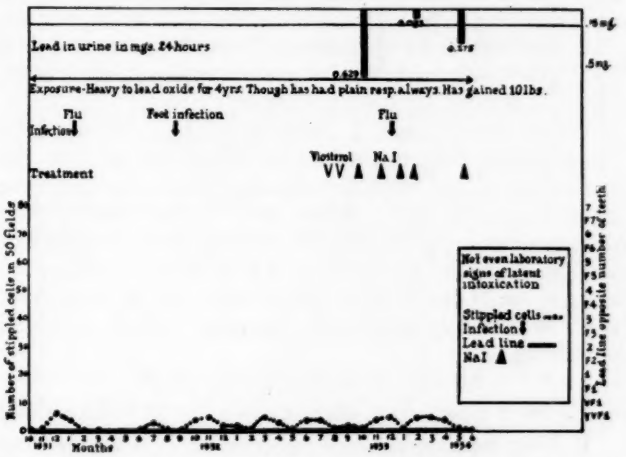


Fig. 9 (case 4).—This example of preventive treatment shows not even laboratory signs of latent intoxication until lead excretion has been stimulated by prophylactic deleading. Even though it has been as yet feasible only to supply this man with a plain respirator, he has had heavy and continuous lead oxide exposure for four years in an unavoidably hazardous work station where disabling lead colic has consistently developed in other men. He has had several infections with no deleterious effects. He seems to belong to the group of apparently good risks. He has been absorbing excessive quantities of lead that should be disposed of under controlled conditions.

to be the logical final stage of treatment for all four types of lead absorption with or without intoxication.

When I speak of deleading, I do not mean to give powerful deleading agents in the midst of an acute intoxication. This might provoke an encephalopathy. Neither do I mean that an individual is to be given deleading medication and then be discharged from treatment or the factory to continue the process indefinitely and unsupervised. I have certain definite criteria for deleading. I do not consider it advisable until all acute symptoms have subsided for a month, until the hemoglobin is 80 or above, until the red blood cell count is four million or over, and until the stipple cells have dropped to 10 or below in fifty fields (from 1,000 to 5,000 per million red blood cells) and have remained there for two or three weeks, and finally until the lead in the twenty-four hour urine is 0.15 mg. or lower. This insures that no great amount of lead is freshly liberated from the skeleton to be superimposed on lead still freely circulating throughout the body.

For the first two or three courses of deleading, supervision is extremely close in order to note a possible return of symptoms or of the lead line with increase in stipple cells and lead in the urine. If these should reappear I am prepared to fix the lead again in a nontoxic form by high calcium intake. That the lead line does often reappear at first is to me a striking clinical proof of the efficacy of deleading. I do not delead oftener than once in four weeks, and preferably not oftener than once in six or eight weeks, with the first two or three courses of deleading. In this way I avoid the unfortunate consequences of cumulating fresh lead on a preceding tide of loosened lead that has reached

its peak at about two to three weeks after stimulation. For the same reason I do not prolong any course of deleading over three or four days. Though I have used them successfully in a few hospital cases I have not yet found it practical to use ammonium chloride and sodium bicarbonate or a low calcium diet to delead men who are actually at work; but it is very easy to give them their iodide drops twice a day, a safe, effective dose being 15 drops of potassium iodide or 7 drops of sodium iodide in saturated solution. Such doses may seem inadequate, but I have found from experience that they just avoid symptoms of actual iodism and that they gently stimulate lead excretion without any recurrence of serious signs or symptoms of lead intoxication.

Using this technic, I have found that it may take from six to fifteen courses of deleading to free the individual of his most loosely combined and therefore most dangerous lead. After this, further prophylactic deleading or even the acidosis of acute infection usually fails to stimulate an increase of lead in the twenty-four hour urine above 0.15 to 0.2 mg., so that it is unlikely that there will be any recurrent toxic episodes of lead poisoning.

SUMMARY AND CONCLUSIONS

My own experience, then, causes me to believe that:

1. This type of medical supervision is a highly specialized form of work, although it requires the broad background of internal medicine.

2. One must still have a workable course of scientific treatment of lead poisoning to care for workers until the engineers have made lead absorption impossible.

3. I have here presented a clinically proved and detailed method for the control of lead poisoning in the worker at work.

4. One should not wait for disability before one starts treatment.

5. Thoughtless and wholesale calcium treatment may be unwise, but when given advisedly it is of specific aid.

6. Even the so-called insusceptible workers may have relatively large quantities of stored lead ready to be liberated by natural or artificial means.

7. With perfectly controlled technic, in selected cases, artificial deleading of cases previously heavily loaded with lead is a benefit not only to industry but also to the worker, and it is safer than uncontrolled spontaneous deleading.

231 West Wisconsin Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. LANZA, AUB, KEHOE, THAMANN AND CHOLAK, JONES, BELKNAP AND GRAY

GEORGE H. GEHRMANN, Wilmington, Del.: The presence of lead in normal urine, well demonstrated by Kehoe, Thamann and Cholak, has been of great help to many in industry. Dr. Belknap mentioned that the cooperation of the officials of any industry is most important: that without cooperation it is impossible to accomplish any real work in the prevention of lead poisoning. I agree with the author that the history is important. The man is on the spot. He wants a job and he is afraid that any information that he may give concerning himself may result in his being unable to take up that particular line of work; too much dependence should not be placed on the history. I have had cases of active pulmonary tuberculosis, as proved by physical and roentgen examination, in which any symptoms whatever were denied. The author did not mention in his discussion of lead absorption and lead intoxication frequent air analysis at the site of the operation and at various sites in that particular operation, which will often reveal valuable information as to the source of contamination of the supply of lead dust or lead fumes. I have been taking measurements of the extensors and the flexors of the wrist but have been unable to deduce any really valuable information from this test. After going over several years of work and many thousand tests, I decided to discontinue them. I do not practice deleading in any of my cases. I make a definite attempt to mobilize all lead in those cases which show signs of lead intoxication.

DR. PAUL A. DAVIS, Akron, Ohio: The method presented by Dr. Belknap is very much in accord with the method I have used for the last ten years in dealing with lead workers. There are three important factors in this problem: (1) employing only physically fit persons on lead work and those with good dental conditions, (2) frequent examinations of blood, urine and blood pressure, and (3) maintaining a proper ventilating system and personal hygiene. The main object in all industrial toxicosis is prevention. I have kept an individual chart in some cases for the last ten years and have correlated the stippling of red cells with the symptom complex, urinary tests and general physical condition and have found that this is the most accurate method for determining the absorptive index in lead cases. If the physician can have his finger on all the data there is little excuse for the development of a case of lead poisoning; but he must be able to interpret the clinical conditions found and know when to remove an individual from exposure and when to institute treatment. The eliminative process is influenced as to the function of the various organs and especially as to whether the system is bordering on an acidosis or alkalosis. If acidosis is present, more soluble lead is present in the circulating body fluids and severe symptoms may develop if this acidosis is very high. If severe symptoms are present, the logical procedure is to produce an alkalosis and drive the soluble lead out of solution or produce insoluble compounds that are less toxic. This is done by using calcium gluconate for immediate relief and diet for further improvement; then a mild acidosis should be produced and elimination increased until the patient is cured.

DR. MILLARD KNOWLTON, Hartford, Conn.: A more harmonious view concerning governmental participation in matters of this kind can be reached if the situation is considered more closely. Instead of combining the compensation phase of the matter with the research and advisory aspects, if the research and advisory work can be kept separate from the compensation work, with legal restrictions prohibiting the use of information obtained by research and investigation, and the use of reports of occupational disease, in compensation cases and court cases, the industries will seek advice and carry out recommendations for correcting conditions. We have had that experience in Connecticut, where the law provides that information obtained through investigations by representatives of the state department of health, bureau of occupational diseases, cannot be used in court action or in compensation cases, nor can the reports of occupational diseases be used in such cases. Under these conditions our bureau has been able to work on a basis that puts its service in demand. Industry is coming to it for advice and is asking the bureau, with its laboratory facilities and trained men, to investigate conditions and recommend corrective measures when necessary. Working on this basis, we do not find that governmental agencies are antagonistic to industry.

DR. ELBRIDGE J. BEST, San Francisco: I wish to ask a question. If I understood correctly, it was mentioned that there were respiratory symptoms that were as important as the gastro-intestinal symptoms. If that is so, I should like to have it explained. In San Francisco, bridges are being built. The steel is covered with lead and several workers have been leaded. There have been a large number of respiratory diseases, naturally precipitating a certain percentage of lead cases, and a number of them have been brought before the industrial accident commission as lead, in which no lead has been found, and it would be helpful if a little could be said on that point.

DR. A. J. LANZA, New York: I will answer the doctor's question. The statement I made was that in ordinary experience of disability among working people the respiratory diseases

outnumber the gastro-intestinal. That is the average experience. There are almost three times as many cases, or claims for colds, influenza, pneumonia and bronchitis as there are for diseases of the gastro-intestinal tract; but if in any industrial plant absenteeism on account of illness is due more to gastro-intestinal disorders than it is to respiratory disorders, it is well to keep in mind the possibility of lead poisoning.

DR. ROBERT A. KEHOE, Cincinnati: Deleading as a diagnostic measure is, in my opinion, unwarranted. It is my belief, based on observations, that the average normal adult has in his tissues somewhat more than 100 mg. of lead. Suppose that deleading is undertaken as a diagnostic procedure. Though lead exposure is suspected, normal quantities of lead are found in the urine and feces. An effort is made to promote excretion, and if the methods work—and I must stress the fact that in my opinion evidence for this is not very good—there is a rise in lead excretion. How, then, shall it be interpreted? In treatment of lead poisoning by deleading, one removes in a short time, comparatively, an amount representing only a small proportion of the total lead in the tissues. It takes from six to twelve or eighteen months for the abnormal amounts of lead in the leaded individual's tissues to be excreted naturally. If an attempt is made to delead in a week, two weeks, a month, the rate of excretion may perhaps be doubled or trebled; 35 or 40 mg. will have been got out of the tissues, and 200, 300, up to 1,000 mg. will have been left behind. I don't want to stress the point in theory, but in practice I question the advisability of elevating lead excretion temporarily. One runs a certain risk of producing symptoms not only immediately but also possibly later, and one runs that risk for what seems the slight and evanescent advantage of avoiding a very slight delay. Dr. Lanza spoke of the possibility of latent lead poisoning appearing two or three years after exposure had ceased. I have yet to see a case presenting a history of severe exposure and an interval of two years or more between cessation of exposure and death in which more than the normal residue of lead was found in the tissues. On the basis of such evidence as I have —confined to the study of some eight or ten leaded individuals— I have concluded that in a period of from twelve to eighteen months the total lead has been eliminated to what is practically a normal level.

DR. R. R. JONES, Washington, D. C.: Some American clinics and those on the continent of Europe are stressing the fact that reticulocyte counts are more important than are stippled counts for this purpose, since the latter are but one form of the reticulocyte. Whitby and Britton have shown this experimentally. They gave lead salts intravenously and on the fourth day found a maximum rise in the reticulocytes to about 30 per cent, while later, about the sixth day, the maximum stippled cell count was reached, and it was only about 8 per cent. Second injections two weeks later gave an immediate rise in the reticulocytes again, while the stippled cells remained about constant. They also showed that the stippled cells appear in waves, an increase in them being at the expense of the diffuse polychromatic cells. There is no definite distribution of stippled cells. I have seen men with stippled cell counts of more than 3,000 not ill but later go on compensation for plumbism with stippled cell counts of but 50 or 60. It would seem therefore that this variable stippled cell count cannot be as dependable as the reticulocyte estimation. If the stippled cell is a reticulocyte and there is but 8 per cent as compared with 30 per cent of total juvenile cells, surely one gets early evidence of this increase in reticulocytes prior to that obtained by watching for stippled cell increases. Stippled cells are easily estimated, and as a manifestation of lead poisoning they are of definite value in studying a case of lead intoxication. They are evidence of a disturbance in calcium metabolism. Giving calcium intravenously will cause a disappearance of this stippling, while such treatment will not influence the reticulocyte count at once. High calcium diets exhibit the same effect on the stippled cell.

DR. ELSTON L. BELKNAP, Milwaukee: Dr. Gehrmann has emphasized the value of air sampling in the prevention of lead poisoning. I have been doing that and expect to produce a more detailed paper on that basis. It is the ideal method as a check on one's engineering and medical control. Dr. Knowlton speaks of state control. Medical societies in Wisconsin are taking the initiative in investigating industrial conditions so that the fundamental control remains in the hands of the physician in practice. Dr. Kehoe has brought up a very natural objection to the value of deleading, but I have found it safe in my own experience. I have followed cases for two and three years after deleading and have found that deleading does keep a man within safe limits even in continued exposure. The cases described today represent many others. I expect to continue deleading under definite criteria. I must repeat that if physicians do not delead workers, nature is sure to do it in an alcoholic episode or in an acute infection. It still seems wiser to attempt deleading when the process can be controlled, especially since the worker is being kept at work where he remains exposed to lead. I hope in this way to keep pace with the small amount that he absorbs from day to day. I do not attempt to get rid of any but the most loosely combined lead and only small amounts of that. I expect to use the reticulocyte count described by Dr. Jones and correlate it with my stipple cell curves. I wish to repeat that the stipple count is valuable when one watches its curve for a sudden rate of rise, a sure prediction of impending intoxication. Dr. Davis in his experience agrees with this. Low calcium and acid diets for deleading, described by Dr. Gray, have borne out Dr. Aub's research but are feasible only when hospitalization is possible, in my experience. Deleading is not to be considered other than an emergency measure while the worker continues his exposure to lead. The ideal method is to move the worker or, if that is not possible, to increase his calcium intake for a while. The physician's work in industry is to deal with the practical necessity of keeping the worker well while he continues his hazardous occupation. In this way they can best cooperate with the management for every one's benefit.

DR. IRVING GRAY, Brooklyn: The two slides shown by Dr. Kehoe of the amount of lead obtained respectively from the tissues of an infant after death and from a male adult after death, neither having been exposed to lead, is eloquent proof of the fact that the average normal human being absorbs and stores lead in the system. In the process of deleading, it is reasonable to assume that all the lead that can be readily mobilized is excreted. The probability is that some lead remains in the tissues, as was shown experimentally by Aub. The lead that is retained is firmly fixed in the tissues and is innocuous. In view of Dr. Kehoe's observations at autopsy, it would seem logical to expect that under the deleading treatment this heavy metal would be found in the excreta of individuals not unduly exposed. My experience has shown that lead is present in urine and stool after deleading treatment only in those who have absorbed abnormal amounts. In contentious cases in which all clinical signs of plumbism are absent, the low calcium, high phosphorus diet and the institution of phosphate therapy (deleading treatment) has a definite place. Under a hospital regimen the diet can be controlled, the patient can be carefully observed and the rate of excretion can be determined. As an aid in the differential diagnosis, deleading is distinctly of value.

DR. JOSEPH C. AUB, Boston: I should like to say a few words in regard to the new evidence developed by Dr. Kehoe in his discussion. It is important to remember that the source of readily available calcium which is easily liberated from bone is a small source. These trabeculae are easily replaced as well as easily liberated. Most of the weight of calcium in the body is in the solid cortical bone. Though lead may also be stored here, I do not think that various methods of depleting bone greatly disturb the regular metabolic replacement of this solid portion. The calcium and lead pulled from bone in acidosis, in dietetic abnormalities, or in abnormalities of the internal secretions come largely from the fine bony trabeculae scattered through the bone marrow. These trabeculae are not large but I think it is the lead stored in them that precipitates episodes such as Dr. Belknap described as occurring with acute infections or metabolic upsets. The value of deleading consists of eliminating the lead in this readily available supply of bone salts, and replacing this calcium-lead mixture with uncontaminated calcium by means of milk and a high calcium-phosphate diet. If this is done, future metabolic demands on the bone salts will liberate a store that is not thoroughly impregnated with lead but has been purified by therapy.

Clinical Notes, Suggestions and New Instruments

INTERNAL DERANGEMENT OF THE KNEE AND SLIPPING PATELLA

SIMULTANEOUS OCCURRENCE IN THE SAME KNEE

FRITZ TEAL, M.D., AND H. WINNETT ORR, M.D.
LINCOLN, NEB.

Internal derangement of the knee joint due to tearing of the internal lateral ligament and detachment of a portion of the internal semilunar cartilage is a common disability. Recurrent slipping of the patella, however, is rather unusual and, when the two conditions occur in the same knee at the same time, a situation exists that calls for radical surgical relief. We report a case in which the foregoing conditions were manifest and describe the method by which an excellent cure was obtained.

REPORT OF CASE

History.—C. C. S., a man, aged 37, sustained an acute injury to his left knee in August 1930. Repeated aspirations yielded bloody fluid, and after three weeks the knee assumed its normal appearance. Pain persisted in the medial side and it was evident that the patient was suffering from a tearing of the internal lateral ligament and partial detachment of the internal semilunar cartilage. Operation at that time was advised but refused. He suffered repeated injuries to the same knee in the ensuing years.

A, transferred outer half of quadriceps tendon; *B*, quadriceps tendon; *C*, patella; *D*, incision for removal of cartilage.

March 23, 1934, he entered the office with a swollen and painful knee, telling of an injury the night before. The knee was aspirated and a compression bandage applied. The knee responded readily to treatment, but convalescence was prolonged by the presence of another disability in the nature of an outward slipping of the patella. The latter disability was painful and annoying and kept him from his work. Operation was advised and performed a few days after.

Operation and Result.—Under local infiltration, the quadriceps tendon and muscle were exposed from the patella to a point 6 inches above. The outer half of the tendon was separated for 6 inches and severed from its attachment to the patella well down on the outer border. A subcutaneous tunnel was made toward the inner side of the knee. Next the usual medial incision was made and the internal semilunar cartilage removed. It was found detached at its posterior third and greatly thickened. A stab wound was then made over the internal lateral ligament and the tendon as prepared was pulled through the tunnel and its free end sutured with heavy silk to the internal lateral ligament. The deep fascia of the thigh was sutured to the cut border of the intact quadriceps tendon with chromic gut and the skin closed with plain catgut. The knee wound was closed in layers, care being taken to repair the capsule. A cast was applied from the toes to the hip, with the knee in 10 degrees flexion. The leg was suspended in a Balkan frame for a period of two weeks, after which time the cast was removed and passive motion was started.

After nine weeks the knee is free from swelling, and flexion and extension are normal in range. The transferred tendon has become adhered to the structures on the medial side of the patella and on extension puts a direct pull on the internal lateral ligament. The fibrosis in the region of the transferred tendon is sufficiently strong to prevent lateral displacement of the patella. The pain and disability in the knee have, on the patient's own statement, entirely disappeared.

307 Sharp Building.

TREATMENT OF A CASE OF CHRONIC VAGINITIS WITH PHENYLMERCURIC NITRATE

FREDERIC WADE HITCHINGS, M.D., CLEVELAND

It is a matter of common knowledge that it may be extremely difficult to cure a leukorrheal condition. In attempting to do so, the first requisite is to determine the cause. This in itself may be no easy task, and success need not necessarily lead to cure. Bacterial infection, the invasion of parasites, and anatomic and even physiologic conditions all have to be considered. Often several factors from different sources act together in what may be a distressing condition for the patient. So-called remedies are numerous and too often are useless. The case reported here seems to be worth putting on record for two reasons. The first is that it resisted all efforts at treatment for five and one-half years. The second is that cure finally was promptly, and apparently permanently, brought about through the use of douches of phenylmercuric nitrate.

In the fall of 1928 an unmarried woman in her late thirties had recourse to what proved to be an unfortunate expedient in using a cotton tampon instead of a menstrual pad during one of her menstrual periods. After the period was over, she removed, at least as she thought, all of the cotton. About a week later she began to have a profuse and foul vaginal discharge. As I was out of town at the time, she consulted a colleague who was caring for my patients. The colleague made a vaginal examination and found that part of the cotton had not been removed. He gave appropriate directions as to treatment, but the discharge persisted and in about a month the patient consulted me.

On further examination no particular changes were observed in regard to the condition of the uterus, fallopian tubes, ovaries and vagina beyond the fact that there was moderate reddening of the mucous membrane of the vaginal wall and the cervix. A few weeks later a rather severe acne of the face and upper part of the back appeared and persisted during the period of treatment. The question arose as to whether or not there might be any connection between the acne and the vaginitis.

Too much space would be required to give in detail all the facts connected with the case. Suffice it to say that as regards diagnosis, repeated examinations of smears failed to reveal any gonococci. Trichomonas vaginalis was never found. A colon bacillus infection was considered but could never be proved to be a cause. It was finally concluded that a Staphylococcus albus infection was responsible, owing to the predominance of this organism in the vaginal secretions and because it was found also in the acne pustules. It may be interpolated here that the pustules were deep, rather than superficial, in character.

As regards treatment, various solutions were used for douches of strength varying from very weak to as strong as could be tolerated. Physiologic solution of sodium chloride, boric acid solution, potassium permanganate, the brief use of corrosive mercuric chloride in a strength of 1 : 5,000, lactic acid, and compound solution of cresol were among those most thoroughly tried. Weak permanganate solution seemed to be the best, but only through affording more prolonged periods of cleanliness than the others.

Other measures consisted in application of 1 per cent mercurochrome to the vaginal wall, cervical canal, and interior of the uterus, and the use of tampons, trinitrophenol suppositories, 2 per cent iodine (tincture) on the vaginal wall and 10 per cent in the cervical canal, applications of 2 per cent glycerite of tannin and its use in tampons, and insufflations of powdered boric acid. The cervical canal was cauterized on several occasions with a saturated solution of silver nitrate or with trichloracetic acid. Implantations of cultures of Bacillus acidophilus were tried over a considerable period of time, but the need of frequent douching with physiologic solution of sodium chloride to remove the foul secretions probably prevented any benefit.

As the foregoing as well as other measures utterly failed to cure, recourse was had to the use of a vaccine made from Staphylococcus albus from both the acne lesions and the discharge. From the facts that an injection was followed in a few hours by the acne becoming worse and the discharge more profuse, this seemed to have a certain amount of effect, espe-

cially as there was later temporary improvement in both skin and vagina. It was impossible, however, even giving a long series of injections and using local measures at the same time, to overcome the infection.

Early in April 1934 the patient's condition was as bad as ever. She was obliged to wear menstrual pads constantly. The discharge was very profuse and so foul that, unless unremitting care to douche at least twice a day was taken, the odor was noticeable. The vulva had become exquisitely sensitive. The general health was below par.

At that time, thanks to Dr. E. E. Ecker of Western Reserve University, I had already been using phenylmercuric nitrate for some months as a local antiseptic in a wide variety of conditions, and with gratifying success. Bactericidal efficiency seemed to be at a maximum, while tissue irritation was indubitably at a minimum.

The patient was instructed to take douches twice a day, using phenylmercuric nitrate in a glycerin solution of 1:1,500 diluted down to 1:20,000. From the first, the vaginal discharge began to diminish along with disappearance of the odor. It is impossible to say exactly when the discharge stopped, but at the end of three weeks it had been gone for several days. On account of the possibility of mercurial irritation of the mucous membrane and of the kidneys, the patient was told to discontinue the douches and await developments. To date and frankly, after such a history, to my surprise, there has been no recurrence of the vaginitis in six months. There has been complete restitution to normal. Moreover, the acne began to improve with the improvement in the local condition and is hardly noticeable at present. There has also been great improvement in the general health.

Judging from the fact that the discharge disappeared as a result of using the douches without any direct intracervical or intra-uterine applications, the infection was confined to the vagina. As surmised when the acne first appeared, that it was connected with the vaginitis seems apparent. It should be stated that at no time was evidence of mercurial irritation of either the kidneys or of the mucous membrane of the mouth found.

10026 Euclid Avenue.

THE USE OF SODIUM DESOXYCHOLATE FOR THE IDENTIFICATION OF PNEUMOCOCCI

EINAR LEIFSON, PH.D., BALTIMORE

During the course of a study of the effect of sodium desoxycholate on the growth of bacteria it was found that sodium desoxycholate dissolves pneumococci much more rapidly and completely than does bile. Although this observation was made entirely independently, it was subsequently found from the literature that sodium desoxycholate has been used for this purpose for some time by a number of people, especially in England.

As early as 1917, Mair [1] described a method for the preparation of desoxycholic acid and stated that its solvent action on pneumococci is very much more powerful than that of bile and the common bile salts. Some years later Mair [2] published a detailed discussion of the solubility of pneumococci in bile and bile salts. Swarn and Cooper,[3] in a publication on the use of sodium desoxycholate in the treatment of pneumococcic empyema, state that they have used sodium desoxycholate in place of bile for some years for the identification of pneumococci. Their technic is similar to that of Mair. Mair makes a stock solution of sodium desoxycholate of 10 per cent concentration in water. This solution is stable and need not be sterilized. One-tenth cc. of this solution is added to 5 cc. of the culture. Lysis usually occurs within five minutes.

In this laboratory we have used sodium desoxycholate in the diagnosis of pneumococci for a considerable length of time. Our technic has been to add 2 drops of a 10 per cent water solution of sodium desoxycholate to 1 cc. of pneumococcus culture. The culture becomes perfectly clear in from two to five minutes. We have never found any streptococci that are dissolved by sodium desoxycholate, and, conversely, we have never found any pneumococci that are not dissolved by sodium desoxycholate. As stated by Mair, the p_H of the culture to be tested must not be below 6.5. Below this p_H desoxycholic acid will precipitate from the solution. The temperature at which the test is carried out is of little practical importance as long as it is kept below 50 C. Above 50 C. the autolytic enzymes, according to Mair, are destroyed and without the presence of these enzymes the pneumococci are not soluble in bile or the bile salts.

This test has apparently not been used much in the United States, and since it is so far superior and convenient as compared to bile it seemed worth while to publish this notice. The only source in this country seems to be Riedel-de Haen, 105 Hudson Street, New York.

1833 East Monument Street.

From the Department of Pathology and Bacteriology, Johns Hopkins University.

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2. Mair, W.: The Pneumococcus: Autolysis and Solubility in Bile, System of Bacteriology, Medical Research Council **2**: 168, 1929.
3. Swarn, B. R., and Cooper, T. V.: Treatment of Pneumococcal Empyema with Bile Salts, Brit. M. J. **2**: 1117 (June 23) 1934.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. H. A. CARTER, Secretary.

THERAPEUTIC EXERCISE

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AND
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CHICAGO

(Concluded from page 120)

THERAPEUTIC EXERCISE OF THE ELBOW JOINT

The elbow is a hinge joint. The trochlear surface of the humerus articulates with the greater sigmoid cavity of the ulna, the capitellum of the humerus with the cup-like depression of the head of the radius, and the lesser sigmoid cavity of the ulna with the circumference of the head of the radius. The articular surfaces of the elbow are in an oblique position, and this, together with the position of the bones of the forearm, forms what is termed the carrying angle. This is seen with the arm in complete extension and measures about 170 degrees, varying of course in different individuals.

The head of the radius, which is in contact with the capitellum of the humerus and lesser sigmoid cavity of the ulna, makes movement possible in any direction. This articulation and the distal radio-ulnar joint make possible pronation and supination of the forearm.

The ligaments that give added strength to the joint are the capsular and the orbicular. The capsular ligament has four thickened bands, the anterior, the posterior, the internal lateral and the external lateral ligaments. The orbicular ligament around the head of the radius holds it against the ulna.

The synovial membrane is very extensive, becoming most superficial on each side of the olecranon process.

The movements of the elbow joint are flexion and extension; owing to the obliquity of the trochlear surface, these are not in a straight line. Flexion is accomplished by the brachialis anticus and biceps, assisted by the muscles arising from the internal condyle of the humerus and by the brachioradialis. Extension is performed by the triceps and anconeus, assisted by the extensors of the wrist and fingers. The arc of flexion and extension varies from 120 to 150 degrees,

extension taking place in a straight line and being limited by the olecranon process of the ulna on the posterior side of the humerus, and flexion being stopped by contact of the muscles of the anterior surface.

Pronation and supination of the forearm take place at the elbow and at the distal radio-ulnar joint, as previously described; the radius rotates at the elbow, and the ulna at the wrist. These joints make it possible to rotate the hand through nearly 180 degrees. This, together with the 90 degrees rotation possible in the shoulder joint, makes a range of 270 degrees for the hand when the elbow is fully extended.

The muscles which supinate the arm are the biceps and the supinator brevis, and those which pronate are the pronator radii teres and the pronator quadratus.

While the arm is in a sling or splint, "muscle setting" can be commenced with the biceps and triceps, and the muscles of the forearm. "Muscle setting" is the contraction and relaxation of the muscles without moving the joints.

When the tenderness has subsided, graduated extension of the elbow may be started while the arm is in a sling. The sling is slackened so that the elbow may be allowed to extend about 20 degrees, and voluntary movement can be advised within that radius. When these movements are painless, the sling can be relaxed still farther from day to day.

If the patient complains of pain following this treatment and the range has decreased rather than increased, it is a sign that too much was attempted the previous day and is an indication that the joint is too actively inflamed to undergo this treatment.

For passive motion, the patient should be placed in a sitting position at the side of a flat, padded table, and a smooth board, which has been well powdered, placed on pillows to bring the arm to a level with the shoulder. The arm is removed from the sling with care and placed on the board. The arm is grasped by the operator with one hand just above the elbow, and the other hand takes hold of the wrist. The elbow joint is then moved very gently but firmly through its complete range of flexion and extension, only once. Spasm should be avoided.

In relaxed movements of the elbow, according to Mennell, the patient should be in a sitting position, the operator should be in a position to support the part without difficulty, and the motions should be a natural combination. One hand of the operator grasps the arm of the patient at the elbow and the other hand holds the patient's hand. As the forearm is flexed, the shoulder is extended and the forearm is supinated. When the movement is reversed, the shoulder is flexed and the forearm extended and pronated. Active assistive exercise should follow as soon as possible.

When the patient's arm is out of a sling, active home exercises may be begun.

EXERCISES FOR THE ELBOW

1. Lying on the face, the forearm supported by the operator over the edge of the table, the patient bends the elbow, with the aid of gravity, to increasing angles.

2. Lying on the back, the forearm supported by the operator, straighten from increasing angles.

3. Sitting, with the inner side of the whole arm resting on the table on powdered cardboard: (*a*) Bend the elbow by sliding the forearm along the table. (*b*) Start with the elbow bent, and straighten.

4. Sitting, with the back of the whole arm resting on the table, raise the forearm until the hand touches the shoulder, and lower. Give resistance by putting pressure in front of the wrist, then back.

5. Sitting or standing, the arm at the side, raise the forearm until the hand touches the shoulder. (*a*) Book in hand, lift the book to the shoulder.

6. Sitting or standing, the arm at the side, weight in hand: (*a*) With the palm facing forward, bring the weight to the shoulder and lower to the side. (*b*) With the back of the hand facing forward, bring the weight to the shoulder and lower to the side.

7. Standing, grasp the rod or the ledge at full arm's length over the head, the palms facing backward, raise the body until the chin touches the rod.

8. Sitting, the back of the upper arm resting on the table, the elbow bent to a right angle: (*a*) The palm facing the shoulder, turn the forearm until the back of the hand faces the shoulder. (*b*) The back of the hand facing the shoulder, turn the forearm until the palm faces the shoulder.

9. Sitting, the forearm resting on the table, the elbow bent to a right angle: (*a*) The hand resting on the little finger, turn the forearm until the palm faces down. (*b*) Turn the forearm until the back of the hand touches the table. (*c*) The back of the hand resting on the table: turn the forearm until the hand rests on the little finger. (*d*) The palm of the hand resting on the table, turn the forearm until the hand rests on the little finger.

Occupational Therapy.—Sawing is a valuable aid to flexion and extension. With the arms held tightly to the side, weaving baskets, sewing on cards, and rope splicing are excellent.

Using a screw driver gives pronation and supination.

THERAPEUTIC EXERCISE FOR THE HAND AND WRIST

The wrist is a double hinge joint and is capable of all movements except rotation. There are three distinct joints permitting movement of the hand: the radiocarpal, between the radius and first row of carpal bones —the scaphoid, the semilunar, and the cuneiform; second, the midcarpal joint between the two rows, having the trapezium, the trapezoid, the os magnum and the unciform; and third, the carpometacarpal joint between the distal row and the metacarpals. All these joints are of the condyloid variety. They are joined by the capsular ligament and four ligamentous bands, which are anterior and posterior, and the internal and external lateral. The last two are exceedingly strong and well defined bands, while the first two are weaker and fused with the capsular ligament.

The wrist joint movements are flexion, extension, adduction, or ulnar flexion, and abduction, or radial flexion. A combination of these movements produces circumduction. Flexion of the wrist joint is performed by the flexor carpi ulnaris, the flexor carpi radialis and the palmaris longus. The extensors of the wrist joint are the extensor carpi radialis longus, the extensor carpi radialis brevis and the extensor carpi ulnaris.

Radial flexion of the wrist, or abduction, is performed by the abductor pollicis longus, the flexor carpi radialis and the two radial extensors. The ulnar flexors, or adductors, of the wrist are the extensor carpi ulnaris and the flexor carpi ulnaris.

The hand can be flexed on the forearm from a straight and extended position about 90 degrees, but part of this motion takes place in the carpal bones.

Extension takes place through a range of from 45 to 65 degrees. Ulnar flexion of the wrist is about 45 degrees, while radial flexion is less, being limited by the styloid process of the radius.

The movements of the thumb are flexion, extension, abduction, adduction and slight rotation as it flexes toward the fingers and aids in bringing the ball of the thumb to meet the ball of each finger. The range of flexion and extension, abduction and adduction is about 90 degrees.

The flexor pollicis brevis, the opponens pollicis and the adductor pollicis produce flexion and opposition, two movements that are similar in character. The two special extensors, brevis and longus, and the abductor pollicis longus, produce extension. The abductor pollicis longus and the abductor pollicis brevis produce abduction. The adductor pollicis and the first dorsal interosseous muscle produce adduction. Flexion of the distal phalanx of the thumb is performed by the flexor pollicis longus, and flexion of the proximal phalanx is accomplished chiefly by the flexor pollicis brevis. Extension of the distal phalanx is taken care of by the extensor pollicis longus, and of the proximal phalanx by the extensor pollicis brevis.

Flexion of the distal phalanges of the fingers is performed by the flexor digitorum profundus, and of the middle phalanges by the flexor digitorum sublimis. The flexors profundus and sublimis both act to a slight extent on the proximal joints. Flexion of the proximal phalanges with extension of the interphalangeal joints is produced by the interossei and the lumbricales, which at the same time extend the second and third phalanges. Extension of the proximal phalanges is performed by the extensor digitorum communis, the extensor indicis proprius, and the extensor digiti quinti proprius. Abduction and adduction of the fingers are movements of the proximal phalanx away from and toward a line through the middle finger. The abductor digiti quinti and the dorsal interosseous muscles act as abductors of the fingers. The volar interosseous muscles operate as adductors of the little, ring and index fingers. In the middle finger the second and third dorsal interosseous muscles act alternately as abductors and as adductors.

In passive exercise of the wrist and fingers, proper combinations are as follows:

1. Flexion of the fingers should be combined with extension of the wrist.
2. Extension of the fingers should be combined with flexion of the wrist.
3. Extension of the wrist with pronation of the forearm.
4. Flexion of the wrist should be given as the forearm movement passes from full pronation to a position midway between pronation and supination.

In passive movements of the wrist, the arm is placed on a smooth board. One hand of the operator grasps the hand of the patient, and the other grasps the forearm well above the wrist. The wrist is then flexed as the fingers extend and the forearm passes from full pronation to a point midway between pronation and supination. This should be done very slowly and evenly.

For ulnar and radial flexion, the arm and the forearm are gently lowered to the board, still flexed at the elbow and at right angles, with the palm of the hand touching the board. Grasp the hand of the patient under the palm and, with the other just above the wrist, carefully deviate the wrist ulnarward, for it is best to start in this direction and then proceed radialward with slight pronation and extension.

For flexion of the fingers, place the forearm in the same position. The palmar surface of the operator's hand covers the dorsal surface of the patient's hand, and the fingers of the operator cover those of the patient. The wrist is well supported and, if possible, in a dorsiflexed position. If the individual phalanges need attention, the procedure is much the same. For extension and hyperextension, the finger tips are pulled back. The operator should bring his fingers over the end of the patient's and then slowly and evenly pull them back. The thumb is flexed and extended, abducted and adducted, and later circumducted.

For pronation, supination, wrist, finger and thumb exercises we use a Kanavel table. Construction details will be supplied on request.

For active exercises for the wrist and hand the following are suggested:

EXERCISES FOR THE HAND AND WRIST

1. The hand resting on the little finger: (*a*) Bend the wrist forward, keeping the fingers straight. Give resistance by putting pressure on the palm near the wrist. (*b*) Bend the wrist back as far as possible, keeping the fingers bent. Give resistance by putting pressure on the back of hand near the wrist.
2. The hand resting on the table, palm down: (*a*) Move the hand toward the thumb. Give resistance by putting pressure on the thumb near the wrist. (*b*) Move the hand toward the little finger. Give resistancee by putting pressure on the little finger side of the hand near the wrist.
3. The hand resting on the little finger, the wrist bent back to bend the fingers, and the wrist forward to straighten. Bend the fingers at the first joint, keeping the other joints straight. Give resistance by putting pressure just above the first joint.
4. The hand resting on the table, palm down: (*a*) Spread the fingers, being careful that the fingers are not raised from the table. Give resistance by grasping the fingers with the other hand. (*b*) Bring the fingers together. Give resistance by putting the fingers of one hand betwen the fingers of the other.
5. The arm resting on the little finger side of the hand, bring the tip of the thumb to the tip of each finger and to the first joint of the little finger, making a circle. Give resistance by putting pressure between the tips.
6. Repeat exercise 5, grasping a towel between the finger tips, using the other hand trying to pull the towel out of grasp.
7. Close all the fingers and the thumb to a tight fist and open fully. Repeat against resistance offered by the other hand.
8. The hand resting on the little finger and the forearm on the table, the elbow bent to a right angle: (*a*) Turn the hand so that the palm rests on the table. (*b*) Turn the hand so that the palm faces up, being careful that movement is not made in the shoulder.
9. Carry a book between the thumb and the fingers flat on the book, the arm at the side.
10. Carry the book on the palm of the hand, with the fingers straight.
11. Pick up a soft rubber ball, grasping and letting go. Decrease the size of the ball.
12. Wring out different sizes of cloth.

Occupational Therapy.—Curative occupational therapy in the form of basket weaving, cutting tin designs with tin shears, leather work, painting, carpentry and other forms may be used effectively. All of these are used only after the wrist, hand and fingers have secured sufficient range and strength of movement. Before this a patient with a stiff wrist and fingers may be asked to wind cord into a ball.

THERAPEUTIC EXERCISE FOR THE HIP JOINT

The hip joint is of the ball and socket variety, having greater strength and less mobility than the shoulder joint. It is situated deep and is formed by the head of the femur articulating with the acetabulum of pelvis, produced by the union of ilium, ischium and pubes.

The iliofemoral ligament, which forms the anterior part of the capsular ligament, is exceedingly strong. It checks hyperextension and is very important in maintaining the upright position.

The chief movements of the joint are flexion, extension, abduction, adduction, internal rotation, external rotation and circumduction, the last being a combination of flexion, extension, abduction and adduction.

Flexion is produced by a forward movement of the thigh until it comes in contact with the abdomen, it being less when the knee is straight, owing to the checking influence of the hamstring muscles, which are placed on tension. The range of flexion with the knee joint flexed is 150 degrees or more; with the knee extended it is difficult to bring it beyond a right angle with the trunk. The muscles that flex the thigh are the iliopsoas, the rectus femoris, and possibly the sartorius and the tensor fasciae latae.

Extension is the opposite of flexion, and the limb is moved downward and backward. When it is in a vertical line with the trunk, it is stopped by the iliofemoral ligament and the pubofemoral band. Hyperextension is caused by the pelvis tilting backward with the movement of the femur, and the range is about 45 degrees. The chief muscles that extend the thigh are the gluteus maximus and the hamstrings.

Abduction is possible by moving the limb away from the other sideways and is about 50 degrees. The muscles that abduct the thigh are the gluteus medius, gluteus minimus and the tensor fasciae latae.

Adduction is the opposite of abduction and moves the limb through the same plane toward the opposite one, being stopped by contact with it. Adduction can take place farther by moving the limb in front of or behind the other, or when the trunk is inclined to the side. The range in this way can be increased 45 degrees. The muscles adducting the thigh are the adductor gracilis, the adductor longus, the adductor brevis, and the adductor magnus.

Internal rotation is produced by turning the leg inward and is checked by the ischiocapsular and posterior capsular ligaments. The range is about 30 degrees. The muscle producing internal or medial rotation are the iliopsoas, the anterior parts of the gluteus medius and gluteus minimus, and the tensor fascia lata.

External rotation is accomplished by turning the leg outward and is checked by the outer band of the iliofemoral ligament. The range is about 60 degrees, and the muscles responsible are the pyriformis, the obturator externus and internus, the gemelli superior and inferior, the quadratus femoris, the three adductors, the pectineus, the inferior fibers of the gluteus maximus, and the iliopsoas.

The complete range of rotation is about 90 degrees. A combination of flexion, extension, abduction and adduction produces circumduction.

The patient, lying in the supine position, should be completely relaxed for passive movement. The operator stands beside the patient, grasps the heel with one hand and places the other in the popliteal surface with the palmar side up. The knee and the hip are slowly, steadily and evenly flexed, and the hand in the popliteal space is slipped over the head of the tibia, is held for the count of five and is then slowly returned to position. This movement should not proceed to the point of inducing spasm.

Active assistive movements should be started along with passive movements, provided sufficient range has been established with the latter. It is well to start with flexion and extension. The patient is assisted to a lying position on the affected side, the sound leg being placed behind it. The patient is then told to flex the thigh and the knee at the same time, the operator gently assisting the movement by pushing against the posterior part of the thigh just above the knee joint; the knee and the thigh are then extended. This assistive movement may be necessary in the early part of the arc of movement and also in the latter third. Spasm should be avoided. Active assistive movement is followed by free movement in the same plane.

Active movements for rotation are the last active movements attended to. For this the patient is placed in a prone position, face down. The knee is then flexed by the patient to a right angle and he is told to turn the leg outward and then inward.

When sufficient range and strength of movement have returned, weight-bearing exercises may be given, first without apparatus and then with apparatus. Construction plans for home made apparatus will be furnished on request.

EXERCISES FOR THE HIP

1. Lying face down, the leg being supported off the bed, the knee straight, the patient tries to draw the knee toward the bed with the help of gravity (no resistance being used by the operator).

2. The patient lying on the back, the operator lifts the leg (the knee straight) and the patient forces it down.

3. The patient lying on the side to be exercised, a piece of powdered cardboard under the leg, the operator holds the other leg. The patient brings the knee to the chest.

4. Same as in exercise 3, except that the patient brings the leg back.

5. Lying on the back, the leg on a piece of powdered cardboard, move the leg directly sidewise, without lifting the foot, keeping the knee straight and the foot up.

6. Lying on the back, same as in exercise 5, except that the patient brings the leg in.

7. The patient lying on the good side, the operator holds the affected leg up, the knee straight, and the patient brings it down to the other leg.

8. Sitting with the knees bent, the lower legs hanging, raise the lower leg to the side away from the other leg, keeping the knees together.

9. Sitting with the lower legs hanging, raise the lower leg across in front of the other leg to the knee.

10. Lying on the back, the heels on powdered cardboard, the knees at right angles, straighten the knees and return to the first position.

11. Lying on the back, the knees straight, raise both legs to an angle of 90 degrees and move them forward and back, alternating.

12. Lying on the back, the knees straight, raise both legs to an angle of 45 degrees, then 90 degrees, back to 45 degrees and to position.

13. Sitting, the body erect, the knees straight, reach forward and touch the toes.

14. Standing, grasp a chair for support; swing the leg loosely from the hip.

Exercise in the curative workshop with the bicycle saw, which can be run with various appliances to produce different exercises, and working on a foot loom.

THERAPEUTIC EXERCISE FOR THE KNEE JOINT

The knee joint is the largest and the most complex in the body. The great strength that the knee joint possesses is due largely to the ligaments and to a less

degree to the muscles, there being no interlocking or fixation of the bony elements. The capsular ligament is strengthened by the tendons passing over it in various directions and in addition by the internal and external lateral ligaments, which add to its strength. The joint is lined with synovial membrane of great laxity.

There are two crucial ligaments, the anterior and the posterior, which cross each other and firmly bind the femur to the tibia. There are two interarticular fibrocartilages, the larger internal and the smaller external. The former is thinner and subjected to greater strain than the latter.

The patella is roughly circular in outline, its superficial surface dome shaped, to which are attached the expansions of the quadriceps extensor. Its deep surface is irregularly flat, covered with articular cartilage. It has a sliding and rolling movement and prevents the tendon of the extensors from drawing into the groove between the condyles of the femur. The patellar ligament or tendon is inserted into the anterior tibial tubercle well beyond the joint.

The movements of the knee joint are flexion, extension and, in addition, rotation, both internal and external, when the knee is flexed 90 degrees or more.

Flexion is produced by bending of the knee joint, is stopped by contact with the thigh, and has a range of about 135 degrees. The muscles that flex the knee are the hamstrings, assisted by the gracilis, the sartorius, and indirectly by the gastrocnemius. Extension is the opposite of flexion, and the degree range is the same as that for flexion. The quadriceps extensor, aided by the tensor fasciae latae, is responsible for this action.

When the knee joint is flexed to 90 degrees or more, the tension on the ligaments slackens, permitting internal and external rotation of the tibia. This rotary action in the flexed position is of great convenience in climbing, and the lack of it in extension maintains a stable position on the feet. The inward rotators are the semimembranosus, the semitendinosus, the sartorius and the adductor gracilis. The outward rotator is the biceps femoris.

For passive movement, the patient is placed on the side with the knee on a smooth, powdered, rectangular board. The operator stands to the rear of the patient, grasps the ankle with one hand, and with the other firmly takes hold of the thigh just above the knee joint. The knee joint is then slowly, steadily and evenly flexed with the thigh to the point of spasm and held to the count of five. It is then extended in the same manner, care being taken not to extend it completely if pain is present.

Active movement should be started just as soon as there is sufficient range to make it practical. The injured limb is placed in the same position as that used for passive movement. The patient is then asked to flex his knee slowly, steadily and evenly. If any fibrillation occurs, movement should be stopped immediately and the operator should bring the limb back to its former position. At this point the operator assists the patient in flexing the limb in the first third of its arc of movement by gently placing one hand just above the ankle and then gently pulling. This is performed within the limit of pain. The leg is then extended, and assistance is given if necessary in the first and last thirds of the arc of movement by gently pushing the ankle on the posterior part.

Just as soon as assistance is not needed, free and resistive exercise are added. For increased resistive work the pulley weights, the stall bars, the rowing machine, the bicycle, the balance beam and sandbags are used. There are three methods by which it is possible to obtain true free movement; namely, underwater exercise, the roller skate and the sling suspension methods.

Our curative occupational therapy for the knee joint is the bicycle saw, treadle saw, foot loom, stationary bicycle and rowing machine.

EXERCISES FOR THE KNEE

1. Move the knee cap without moving the knee, by contracting the group of muscles above the knee.
2. Lying face down, the knee bent, the foot supported by some one, straighten from increasing angles.
3. Lying on the back, the heels on powdered cardboard, the knee bent, straighten from increasing angles.
4. Lying on the affected side, a pillow between the thighs, the leg on powdered cardboard: (*a*) Straighten from increasing angles. (*b*) Tilt the cardboard to increase gravity.
5. Sitting on the edge of the table, the leg hanging: (*a*) Straighten the knee. (*b*) Add weight to the leg.
6. Sitting on the edge of the table, the leg supported by the operator, at horizontal, bend the knee.
7. Lying on the unaffected side, a pillow between the thighs, the leg on powdered cardboard: (*a*) Bend the knee through increasing angles. (*b*) Tilt the cardboard to increase gravity.
8. Lying on the back, the heels on powdered cardboard, the knee straight, bend to increasing angles.
9. Lying on face: (*a*) Bend the knee through increasing angles. (*b*) Add weight to the leg.
10. Sitting on the edge of the table, the legs hanging, swing the legs back and forth alternately.
11. Standing, bend the knees, raise the heels, keep the knees close together, and return to the erect position.
12. Bicycle riding.
13. Kneeling, sit back on the heels as far as possible.

THERAPEUTIC EXERCISE OF THE FOOT AND ANKLE

There are four sets of joints in the foot when movement takes place: the ankle joint, the tarsal joints, the tarsometatarsal joints, and the phalangeal joints.

The ankle joint is a hinge joint formed by the union of the astragalus and the lower part of the tibia with its internal malleolus and the external malleolus of the fibula. This joint is bound by thick, fibrous, capsular ligamentous bands thickened on four sides by strong bands called lateral ligaments. They are the stronger internal and internal lateral, and the lesser anterior and posterior ligaments.

The subastragalar joint, which is the joint between the inferior articular surface of the astragalus and the superior articular surface of the os calcis, is a double saddle joint allowing movement of the os calcis under the astragalus when the leg is fixed, or of the os calcis on the astragalus when the foot is fixed. The midtarsal joint is of considerable importance and consists of two parts, an outer and an inner one. The outer one consists of the calcaneocuboid and is a saddle joint permitting only a limited degree of flexion, extension, abduction and adduction. It possesses greater strength and weight-bearing qualities than does the inner portion. The inner part is the astragalonavicular and forms the instep above the longitudinal arch. It is a ball and socket joint and is capable of movement in all directions, including rotation. Owing to this fact it does not possess the strength of its outer component. The scaphoid articulates with the three cuneiforms, which in turn articulate with the three inner metatarsals; the two outer metatarsals articulate with the

cuboid. These joints nearly all have flat surfaces, with gliding movements, which are limited by strong ligaments. The toe joints are the fourth set of joints and are of the hinge variety.

There are two arches of the foot, the longitudinal and the transverse.

The longitudinal arch consists of two parts, an outer less movable portion, and an inner one, which is more mobile, because of the ball and socket astragalonavicular joint. The outer component consists of the os calcis behind, the cuboid in the middle and the fourth and fifth metatarsals in front. It is supported by the heel behind and the head of the outer metatarsal in front. The inner component or more movable portion is an elliptic dome and consists of the os calcis to the rear, the astragalus and scaphoid, which form the top of the dome, and the three cuneiforms, and it extends to the heads of the three metatarsals but is supported by the head of the first metatarsal. There is no bony keystone to either the longitudinal or the transverse arch. Both are maintained by ligaments but depend in the last analysis on muscle action for their support.

The transverse arch fuses with the longitudinal components.

The most important ligament that maintains the arch of the foot is the inferior calcaneoscaphoid. The plantar fascia is of considerable strength and corresponds to a "binding rod" of the arch. The transverse metatarsal ligament is a narrow fibrous band connecting the anterior extremities of all the metatarsal bones.

There are three strong points of support, one extending from the heel to the head of the first metatarsal, the second from the heel to the head of the fifth metatarsal, and the third between the outer and inner metatarsals. Strong ligaments bind these supports together.

The movements of the foot are plantar flexion, dorsiflexion, eversion, inversion, adduction and abduction. The terms pronation and supination also are employed, pronation representing eversion plus abduction with some rotation at the calcaneoscaphoid joint, and supination representing inversion and adduction combined with rotation at the calcaneo-astragalar joint.

Dorsiflexion is the elevation of the front of the foot toward the front of the leg. Plantar flexion is a depression of the foot in a direction just opposite to that of dorsal flexion. Dorsiflexion and plantar flexion, chiefly in the astragalotibial joint, take place through a range of from 60 to 80 degrees. With the foot held at a right angle to the leg and the knee straight, dorsiflexion occurs through 10 to 20 degrees and plantar flexion between 50 and 60 degrees, the total range of both being from 60 to 80 degrees. With the knee flexed the range of dorsiflexion of the foot increases, and with the knee straight plantar flexion increases.

Adduction is a deflection inward of the forefoot from the mediotarsal and subastragalar joints. Abduction is a movement of the forefoot outward, which is just the opposite of adduction. Both adduction and abduction take place through the mediotarsal joint.

Eversion and inversion occur as a natural sequence with abduction and adduction. However, with eversion there is a definite lifting of the outer border of the foot, and with inversion a lifting of the inner border. These movements take place through the subastragaloid joint.

The muscles producing dorsiflexion are the tibialis anticus, the extensor digitorum longus, the extensor hallucis longus and the peroneus tertius. Plantar flexion is produced by the gastrocnemius, the plantaris, the soleus, the tibialis posticus, the peroneus longus and brevis, the flexor digitorum longus and the flexor hallucis longus.

Adduction and inversion are produced by the tibialis anticus, the tibialis posticus, the extensor hallucis longus and the flexor hallucis longus. Abduction and eversion are produced by the peroneus longus, brevis and tertius and the extensor digitorum longus.

The movements of the toes are mainly flexion and extension together with some adduction and abduction. Flexion is produced by the flexor digitorum longus and the flexor digitorum brevis. The lumbricales also flex but in addition draw the second, third, fourth and fifth toes medially.

Extension is produced by the extensor digitorum brevis, the extensor digitorum longus and the extensor proprius hallucis. Abduction and adduction are accomplished by the interossei.

Passive movement in dorsiflexion and plantar flexion may be commenced. The patient, lying down, is asked to turn on the side of the involved ankle. The sound limb is flexed and placed in front of the injured one, which is put on a smooth, well powdered rectangular board. The operator then grasps the ankle just above the joint with one hand and the foot with the other hand. The foot is then steadily, slowly and evenly dorsiflexed to the point of spasm and held for the count of five. It is then plantar flexed in the same manner.

Just as soon as sufficient range has been secured, active movement may be started. For active exercise of the sprained ankle, the patient should be placed in the same position as was used for passive movement, and on the same smooth, powdered, rectangular board. The patient should dorsiflex the ankle. This is followed by free and then by light, resistive exercise.

EXERCISES FOR THE FOOT

Exercises should be done slowly, carefully and smoothly. Rest between each exercise.

All except standing exercises should be done with bare feet. Do only the exercises on this list which are marked for you. Repeat the number of times daily as instructed.

1. Sitting, the knees crossed, the foot slightly turned in; pull the foot up.

2. Same position as 1; pull the foot in and up.

3. Same position as 1: (*a*) Curl the toes under, pulling hard. (*b*) Curl the toes under and pull the foot up. Keep the toes curled under. (*c*) Curl the toes under, pull the foot in and up. Keep the toes curled under.

4. Sitting, the foot on a board one inch thick; curl the toes over the edge. Try to touch the floor with the toes.

5. Lying on the back, the knees straight, the feet against the wall, the big toes together, the heels far apart; keep the heels against the wall and bring the forefoot away from the wall as far as possible.

6. Sitting, the big toes together, the heels far apart; raise the forefoot off the floor as far as possible.

7. Sitting, pick up marbles with the toes of the right foot and place them in your left hand; with the left foot into the right hand.

8. Sitting, spread a bath towel on the smooth floor, put the front half of the feet, the toes turned slightly in, on the edge of the towel, the heels far apart: (*a*) Grasp the towel with the toes of one foot and pull toward you, then with the toes of the other foot and repeat alternately, crumpling the towel under the foot. (*b*) Place a weight on the towel.

9. Sitting, the knees apart, the legs crossed, rise, bearing the weight on the outer borders of the foot.

10. Standing, the toes turned slightly in, the feet parallel six inches apart, lift the inner border of the feet, relax half way and repeat. The toes cling to the floor.

11. Follow a straight line on the floor, walking on the outer borders of the feet, the toes curled downward and inward. Make the forward heel meet the backward toe.

12. Standing, lift the inner borders of the feet; rock backward and forward from heel to toe. Do not let the inner borders of the feet down.

13. Walk in a straight line so that the right heel strikes the floor first and the rest of the foot pivots inward 90 degrees. Repeat with the left foot.

14. Walk in a straight line so that the toes of the right foot touch the floor first and the rest of the foot pivots outward 90 degrees. Repeat with the left foot.

15. Standing, the toes turned in and curled under, the heels far apart, face the wall, the toes 28 inches from it; place the hands on the wall, lean the body forward by bending the elbows. *Keep the heels on the floor,* the knees, hips and back straight. Hold this position a few seconds.

RULES

1. When one sits, always cross the ankles, resting the feet on their outer borders.

2. When standing, always keep the feet parallel and the weight of the body equally on the two feet.

3. Walk correctly, the toes turned slightly inward at all times. This is as important as periods of exercise.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. RAYMOND HERTWIG, Secretary.

NOT ACCEPTABLE

KELVITA

MAGIC OF NATURE

The product Kelvita, manufactured by the California Kelvita Company of San Francisco, is, according to the package label, a mixture of dried kelp (a seaweed), wheat embryo and certain dried vegetables.

Discussion of Label and Advertising.—The label states:

"A natural food from California, Kelvita, Magic of Nature, a blend of kelp—wheat embryo—and vegetables, presenting minerals and vitamins needed by the human body to maintain normal health and intelligence. Recommended in the treatment of deficiency diseases and glandular disturbances. . . . One-half teaspoonful dry on the tongue swallowed with water twice daily. . . . It's wise to be healthy. . . Calcium, Copper, Iron, Magnesium, Phosphorous, Sodium."

There is nothing really unique or even extraordinary, nutritionally or otherwise, about this ordinary product. The ingredients wheat embryo (a part of all whole wheat foods) and vegetables are common market and table articles. The kelp, an unpalatable seaweed, has found no place in the American dietary; there is no authoritative information showing a need for kelp in the diet. True, kelp is high in iodine but sufficient iodine may be obtained from the ordinary mixed diet especially when iodized salt, now everywhere available, is used. Kelvita's "minerals and vitamins" are readily obtainable from common market foods. More than "minerals and vitamins" are necessary "to maintain intelligence." The recommendation of the product for "the treatment of deficiency diseases and glandular disturbances" is a vague misinformative medicinal claim. This, accompanied by the statement of dosage similar in form to such statements used for medicines, represents an apparent attempt to transform a food into a medicine. What is meant by the vague designations "deficiency diseases and glandular disturbances" is left to the imagination. This type of exploitation fosters self diagnosis and self treatment, which may seriously endanger health.

The advertising not attached to the package, which is outside the jurisdiction of the federal Food and Drugs Act, assumes greater liberties. Some of the claims are:

"Get Healthy. Increase your happiness and vitality—lengthen your life with Kelvita, magic of nature. . . . Protect it (your body) with Kelvita. . . . Puts pep in your step. . . . Probably one of the greatest and most sensible aids in regaining youthful vigor, with every cell of the body tingling with effervescent vitality, is thru eating Kelvita . . . a balanced blend of . . . concentrated vegetables . . . treated with the natural ultraviolet and infra-red rays from California's magical sun . . . the body consists of some 12 or 16 organic minerals. . . . To maintain health, this natural balance must be kept constant. A lack of one or more minerals results in deficiency diseases, while a lack of several causes death. Constipation, indigestion, worry, decaying teeth, lack of endurance and female disorders are sure signs of mineral deficiency.

"The greatest accomplishments of Kelvita is in the treatment of CONSTIPATION, ANEMIA, RHUMATISM, NEURITIS, LACK OF VITALITY, PROSTATE GLAND TROUBLE, GOITER, NERVOUSNESS, UNDERWEIGHT, WORRY, MENTAL DEPRESSION, BACKWARD CHILDREN, STERILITY OF BOTH SEXES, and PROLONGED AND PAINFUL MENSTRUATIONS IN women. KELVITA is recommended as an accessory food in the treatment of these ailments, is especially useful to prospective Mothers, growing children and convalescents, has brought gratifying relief to hundreds and was tested in a 1000 bed hospital.

"This is why KELVITA is available to you, to furnish your body and those of your loved ones with vitamins and live food-minerals that will so increase the resistance of each body cell as to throw off and keep out every disease. . . . REMINERALIZE YOUR BODY. . . . KELVITA [is] very rich in food-iodine, calcium, iron, phosphorous, copper, magnesium and traces of other minerals. . . . IMPORTANCE OF IODINE. Your thyroid gland lies astride your 'Adams apple,' is more active in women than in men. . . . Your thyroid is perhaps the most important endocrine gland of your body, it controls your emotions. . . . It's secretion is called thyroxin, 65% iodine. Possibly no life exists without iodine and normal life is impossible without 1/100 grain of thyroxin daily. Three and one-half grains of thyroxin are all that lie between intelligence and imbecility. It has been observed that males fed a diet low in iodine are more difficult to arouse sexually and females fed a no-iodine diet become irritable, less sex-conscious. menstruations are more frequent and painful. Carlson says the thyroid is a specific necessity for development of reproductive glands in males and the lunar cycle in females. Food-iodine as available in KELVITA is necessary for the healthy action of your thyroid.

"VITAMINS B and E. Altho KELVITA contains generous amounts of Vitamins A, B, C, and E, we are here principally concerned with Vitamins B and E of which KELVITA is particularly abundant. . . . Vitamin B as in KELVITA is especially needed by children and those desiring to gain weight, insures appetite for other foods to gain bodily growth was proven by the University of California . . . is essential in the mental development of children was proven by Dr. Mauer of University of Chicago. The natural oil in the wheat embryo of KELVITA aids in overcoming constipation.

"Vitamin E is needed by everyone who do not wish to become impotent, (to grow old prematurely), it insures normal development of reproductive organs, prevents sterility. Vitamin E and the food-iodine in KELVITA go hand in hand toward this end. Needed by prospective Mothers to insure normal development of child and to lessen the chances of the Mothers body becoming mineral starved. Dr. Sherman of Columbia University proved that animals fed a no-vitamin E diet fail to reproduce their kind.

"IT'S UP TO YOU. MAKE YOUR DECISION TODAY. DON'T LET YOUR BODY BECOME A FERTILE FIELD FOR ANY DISEASE. If you eat civilized foods, you need KELVITA. . . . There is no drugs or herbs of any nature in KELVITA. Take it freely every day, notice the great change in your health. Be sure your children get their share. KELVITA is economic health assurance. . . . KNOW THE THRILL OF BEING FULLY ALIVE—THE JOY OF VIBRANT ENERGY. . . . The writer and his family all get their daily ration of KELVITA and for over four years have not had even a cold. He challenges anyone his age to compete in any physical contests."

Kelvita possesses no more "magic of nature" than do common foods. The advertising is of the usual false "patent medicine," quackery type apparently intended to deceive the gullible, the sick, or those with imagined ills. The artifices are clearly evident. Smatterings of facts are intermingled with falsehood, giving the entire copy a semblance of truth. Names of well known authorities are inserted to give confidence. The material is pseudoscientific. The appeal of sex potency, the dread of its loss, are adeptly used to captivate the morbid.

Advertising such as this is an example of the kind that is causing a growing public demand for federal legislation for the control of advertising in the interest of public welfare. The Committee on Foods vigorously opposes such deceptive advertising.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 19, 1935

REPORT OF THE FEDERAL FOOD AND DRUG ADMINISTRATION

The recently published report of the Federal Food and Drug Administration, covering its activities during the year ended June 30, 1934, emphasizes the manner in which the administration has carried on its important work despite the limited resources and facilities provided by Congress and in the face of a notoriously deficient federal Food and Drugs Law. Approximately 54,000 samples of foods and drugs were analyzed by the bureau during the year. Nearly 1,100 criminal prosecutions were recommended and 1,729 shipments of adulterated or misbranded products were seized. Several hundred million pounds of foods from foreign sources were inspected; entry was refused to 4,223 proposed importations of foods and drugs. More than 6,000 samples of fruits and vegetables were analyzed for poisonous residues of sprays used as insecticides. Fifty-eight consignments were found to contain "dangerous" quantities and these were seized. This work the Food and Drug Administration considers its most important single activity; indeed, judging from the large number of shipments seized, spray residues must constitute an important menace to the public health, particularly in view of recent studies on chronic poisoning with heavy metals, for instance those that implicate lead intoxication in the etiology of multiple sclerosis.[1] The administration reports that state agencies have been of great assistance in this work. Fortunately the number of effective devices installed by growers to wash the spray residue from the foods has increased, but it is evident from the number of seizures reported that conditions in this respect are far from ideal.

The return of alcoholic beverages brought a number of new problems to an already overburdened administration. Alcoholic candies, still prohibited by law despite the repeal of the eighteenth amendment, were widely distributed; cases of intoxication among school children from the ingestion of these confections were reported in the newspapers. Nineteen seizures were made and criminal prosecutions were initiated; thus with the aid of local and state authorities this traffic was quickly suppressed. Attention was directed to "products sold as medicinal whisky, but not of United States Pharmacopeial purity; to imitations sold as genuine whisky; to products clearly short in volume; and to products mislabeled as to alcoholic content." About 400 samples were analyzed; none contained ordinary denaturants. Of approximately 250 samples of products represented as medicinal whisky, over two thirds failed to meet the pharmacopeial standards; twenty-nine seizures resulted, and in other cases manufacturers relabeled outstanding stocks. Forty-nine seizures were made of products incorrectly labeled as whisky or as Scotch whisky; for example, mixtures of pomace and raisin brandies, or colored molasses spirits, or Scotch whisky diluted with neutral spirits and colored with caramel. Some products were short in volume or had false and fraudulent therapeutic claims on the labels. In the words of the report, "It is self evident that the present resources of the Food and Drug Administration are wholly insufficient to patrol the entire interstate and import liquor traffic and at the same time meet the other obligations in the way of protecting the purity of the food and drug supply imposed by the federal statute."

Seizures were made of 421 medicinal preparations bearing false and fraudulent therapeutic claims; 232 consignments were made the basis of criminal prosecution. "In the absence of a federal statute applying the same standards of honesty and fair dealing to advertising that now apply to label declarations, manufacturers and distributors of proprietary remedies have an easy method of evading the penalties of the statute by selling their products under truthful labels and continuing their extravagant claims through the medium of advertising."

Only seven cans of anesthetic ether of a total of 1,308 examined were found to be substandard; about 130 of more than 200 samples of other drugs that were analyzed justified prosecution.

A notable section of the report is devoted to the "crystal craze": "The last year or two has witnessed the development of a new type of medicinal humbug in the marketing of almost innumerable brands of so-called mineral crystals, which are essentially laxatives or cathartics and owe their physiological properties to the presence of some well known therapeutic agent, usually sodium sulphate. Medicinal claims of the most extravagant character are made for them. The more adroit manufacturers are careful to restrict such claims to radio and other advertising distributed separately from the interstate package. Where this precaution is taken, action under the Food and Drugs Act is impossible because of lack of jurisdiction. Attention to these products, however, resulted in thirty seizures directed against fourteen products."

1. The Occurrence of Lead in Cerebrospinal Fluid, editorial, J. A. M. A. **102**: 1500 (May 5) 1934; Lead and Multiple Sclerosis, ibid. **102**: 1852 (June 2) 1934.

It is reassuring that the administration proposes to continue its efforts to amend the Food and Drugs Act. Thus the report says:

> The fight for effective food and drug legislation is not ended. The months of effort already expended have not been wasted. Constructive suggestions have been developed in the course of the hearings which will undoubtedly improve the chances for the enactment of legislation at the next session of the Congress. Most important, however, is the aroused public interest in the purity of the food and drug supply, a concern which has long been dormant. This interest, once aroused, will unmistakably grow into a united demand for effective legislation which cannot be gainsaid.

Last week THE JOURNAL emphasized the recommendations of the Council on Pharmacy and Chemistry and of the Committee on Foods relative to new food and drug legislation. Some type of control over advertising is a necessity of the times. Foods and drugs of unsatisfactory potency or purity constitute a real public health hazard.

CONSTITUTION AND HEART DISEASE

Attempts to correlate certain body types with disease states are being made with increasing frequency. Granted that such studies are in their infancy and that their significance is not yet fully appreciated, they are nevertheless of much theoretical and possible practical interest. Recently Pearl and Ciocco[1] have investigated the somatologic differences associated with diseases of the heart in white males.

Their study was based on the records of clinical and anthropometric observations made at the institute for Biologic Research of Johns Hopkins University. For the purposes of the investigation the males (all white) were divided into two groups according to the results of the clinical examinations. In one group were placed those patients who at the time of the examination gave no clinical evidence of cardiac disease, and in the other those who at the time gave clinical manifestations of cardiac disease, mild or grave as the case might be. The total number of males was 245, of whom 133 were "noncardiacs" and 112 were "cardiacs." The basic problem with which the study was concerned was what, if any, significant somatologic differences there are between the cardiacs and noncardiacs of these groups.

Because of the lack of homogeneity in age between the two groups, the final study was confined to those persons whose ages fell between 40 and 69 years. The numbers were thus considerably reduced (eighty-seven cardiacs and fifty noncardiacs) but the relative mean age difference between the groups was much smaller and probably too small to make any appreciable difference in any conclusion regarding somatologic characters. In comparing the two groups on the basis of diagnosed pathologic conditions the cardiacs were characterized as a group by a 100 per cent incidence of heart lesions together with a relatively high incidence of arteriosclerosis, nephritis and diabetes. The noncardiac group showed no lesions of the heart or the circulatory system, practically no nephritis or diabetes, but relatively more syphilis and malignancy.

The mean, median, standard deviation, coefficient of variation, minimum observation, maximum observation and range of variation for each of twenty-two somatic variables were directly measured, tabulated and discussed. The two groups were found substantially identical with respect to mean stature, span, head length, head breadth, biacromial breadth, ear length, ear breadth, height at external auditory meatus, height at suprasternal notch, height at lower costal margin, sitting height and trunk length. The cardiac group exhibited means larger than the noncardiac group by amounts certainly or probably of statistical significance with regard to the probable error in the following dimensions: body weight, biiliac breadth, greatest hip breadth, chest depth, head girth, neck girth, chest girth at expiration, at rest and at inspiration, and girth at the umbilicus. The cardiacs tended to be more variable than the noncardiacs both absolutely and relatively in respect to those dimensions for which they had larger means.

The chest expansion index is significantly smaller, on the average, in the cardiacs than in the noncardiacs. The cardiacs as a group tend also more toward dolichocephaly, though the means place both groups in the mesocephalic class in the standard system. There is, however, no statistically significant difference between cardiacs and noncardiacs in respect to their distribution to the three standard somatologic types, asthenic, intermediate and pyknic.

The broad general result that emerges from this study appears to be that a group of white males with definite heart disease of one sort or another is characterized somatologically, on the average, primarily by greater body weight consequent chiefly on greater body girths and breadths, particularly of the trunk and chest, as contrasted with a group of white males of substantially the same average statute in which there is no cardiac or circulatory disease. Accompanying this structural difference goes also a significant functional deficiency of the chest as a breathing mechanism. All the evidence points to the conclusion that these characteristics of the cardiac group are not the consequence of true innate constitutional differences in the usual sense of the words but are rather due to accumulation of body fat from relative overeating and lack of physical exercise. This conclusion is supported by much evidence as, for example, the substantially identical distribution as to somatologic types in the two groups. Furthermore, Davenport and Love's data on young cardiacs (draft recruits) show that at such relatively early ages there is no marked somatologic differentiation of cardiacs from noncardiacs. The fact remains that the individuals in the cardiac group belonging to each of the three somatologic types

1. Pearl, Raymond, and Ciocco, Antonio: Studies on Constitution: II. Somatological Differences Associated with Diseases of the Heart in White Males, Human Biology **6**: 650 (Dec.) 1934.

asthenic, intermediate and pyknic tend to the heavier and of greater girth than the individuals of the same type who are noncardiacs.

The investigators do not claim, as a result of their observations, that overfatness is a primary or even a significant factor in the cause of heart disease of middle age or of advanced years. Their results do show some association between the two conditions. Studies of constitution in relationship to disease demand a vast material studied under diverse conditions before final conclusions may be drawn.

ABSORPTION AND STORAGE OF VITAMIN A

The circumstances surrounding the discovery of vitamin A emphasized the indispensability of this food factor for normal nutrition. No small part of the investigative effort in the two decades since its discovery has been expended in the detection and estimation of vitamin A in food materials. Many of the puzzling features of the distribution of this factor and its behavior toward chemical manipulation have been partially explained by the recently established relationship between it and the natural pigment carotene. There is convincing evidence that the vitamin A activity of plant materials is due largely to carotene, which, when taken into the body, is transformed to vitamin A, whereas the potency of active sources of animal origin arises largely from the presence of the vitamin itself. Aside from its recognized requirement for maintenance and growth, there exists a close correlation between an adequate supply of vitamin A and the integrity of the epithelial tissues. Widespread metaplasia and infection throughout the body have repeatedly been demonstrated when this food factor is lacking in the food of experimental animals. From the point of view of pathology, therefore, the expansion of knowledge of this essential dietary constituent is justified.

In an effort to extend the knowledge concerning vitamin A, Baumann, Riising and Steenbock[1] have recently investigated the absorption and storage of this factor. When the colorimetric method of determination was applied to the nonsaponifiable portion of the tissue extracts, it was found in confirmation of other investigators that about 95 per cent of the total body store of vitamin A is found in the liver, the remainder being accounted for by the kidneys and lungs. When the liver contained none, the other organs likewise gave a negative test. The tissues of an animal showing the outward effects of deprivation of this factor were uniformly devoid of it. In the new-born, the store of vitamin A in the liver is small; it decreases for a short time, after which the storage proceeds at a rapid rate. The concentration of this food substance in the livers of the new-born can be increased by augmenting the diet of the mother with added vitamin A during pregnancy or lactation. That the process of storage of this factor is extremely inefficient was shown by the observation that, when eight times the quantity necessary to cure ophthalmia was fed daily for four weeks, only a faint trace of stored vitamin was found in the liver. Likewise when a large storage had been attained there occurred a progressive loss as time passed.

The proportion of the ingested vitamin A stored in the liver is not great. Using diluted halibut liver oil as the source of the food factor, the Wisconsin group recovered only about 20 per cent in the livers of experimental animals. The speed of absorption, however, was surprisingly great, the larger part of the absorbed vitamin appearing in the liver between the third and the sixth hour after administration. The feces were then examined for vitamin A; the fact that, after a relatively large dose, none of the vitamin was excreted in this way indicates that a large part of the material was destroyed or converted into a nonactive form in the intestine. The study also showed that, in animals previously depleted, more vitamin A was required to bring about storage than if the previous intake had been adequate.

It appears that vitamin A, indispensable for normal function as well as for intact structure, is exposed to many uncertainties under ordinary circumstances of alimentation before it is stored in the body. Normal digestion and absorption of fats is a prerequisite to the utilization of this food factor. Both carotene and vitamin A can be prevented from entering the body by certain otherwise effective therapeutic agents.[2] Furthermore, the recent studies show that it is easier to maintain those stores than to replenish them. These various observations still further confirm the biochemist in the view that vitamin A continues to merit careful consideration.

Current Comment

SECTION ON SURGERY AT ATLANTIC CITY SESSION

At the Atlantic City session of the American Medical Association, next June, the Section on Surgery, General and Abdominal, hopes to produce a program of rather unusual character, emphasizing physiology and physiologic surgery rather than the technical aspects of the subject. The thesis of the session is the statement by Claude Bernard that "life is contingent upon maintenance of circulation, health upon an equable distribution of an adequate volume of wholesome blood and lymph, the internal environment of the body." Disease represents a disorder of the system for which the correction is sometimes medical, sometimes surgical. Study of the changes that have occurred in the blood and lymph reveals, in most instances, the efficacy of treatment. With this point of view the Executive

1. Baumann, C. A.; Riising, B. M., and Steenbock, Harry: J. Biol. Chem. **107**: 705 (Dec.) 1934.

2. The Utilization of Vitamin A and Carotene, editorial, J. A. M. A. **103**: 1540 (Nov. 17) 1934.

Committee of the section, including Drs. J. L. Yates, Fred Rankin and Harold Brunn, are developing three sessions pointed toward a physiologic approach to the surgical problem. These sessions include:

First session, normal and morbid physiology of blood and lymph formation and distribution. Each presentation, including introduction by American chairman and summaries of medical and surgical aspects, will be limited to ten minutes. An open discussion, limited to five minutes, will follow.

Second session, address by Canadian chairman, papers on diagnosis and treatment of diseases primarily due to faulty blood formation and distribution, limited to fifteen minutes and discussion limited to five minutes.

Third session, papers on prevention, diagnosis and treatment of other diseases (exclusive of those of pleurae, lung and central nervous system) with reference if possible to correlated effects on blood formation and distribution, limited to fifteen minutes, discussion to five minutes.

It will be remembered that the Atlantic City session is to be a joint session with the Canadian Medical Association, and that contributors from both countries will be recognized on the program. Those who feel that they have a contribution of merit for any of the sessions here listed may communicate with the secretary of the section,[1] the final date for submission of title and summary being February 1.

Association News

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next three broadcasts will be as follows:

January 24. Progress Against Arthritis, Irving S. Cutter, M.D.
January 31. Thirty-Six Thousand Deaths, W. W. Bauer, M.D.
February 7. Heart Diseases, W. W. Bauer, M.D.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

January 22. Health in Winter, W. W. Bauer, M.D.
January 29. Organizing for Health, Morris Fishbein, M.D.
February 5. Pipes and a Pump, W. W. Bauer, M.D.

THE ATLANTIC CITY SESSION

Special Exhibits by Various Sections in the Scientific Exhibit

In the Scientific Exhibit at the Atlantic City Session there will be several features sponsored by different sections of the Scientific Assembly.

The Section on Obstetrics, Gynecology and Abdominal Surgery is planning a special exhibit on "The Treatment of Obstetric and Gynecologic Hemorrhage." There will be special demonstrations and motion pictures.

The Section on Pediatrics will present an exhibit symposium on "Acute Infections of the Central Nervous System," with special reference to poliomyelitis, encephalitis and meningitis. This symposium will be composed of a group of exhibits by various individuals, covering the salient points of these diseases.

The Section on Nervous and Mental Diseases will have a special exhibit on "Incipient Nervous and Mental Disorders." It will take up especially the relation of the physician in general practice to such disorders.

1. Dr. Howard M. Clute, 605 Commonwealth Avenue, Boston.

The Section on Dermatology and Syphilology will conduct an exhibit symposium on the subject of "Syphilis," composed of a group of exhibits on different phases of the disease.

Persons desiring to take part in the Scientific Exhibit may obtain application blanks from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DELAWARE

Industrial Medical Research Laboratory Dedicated.—The Haskell Laboratory of Industrial Toxicology of the E. I. du Pont de Nemours Company, Wilmington, was formally dedicated, January 22. The laboratory will be operated by the medical division of the service department of the company to study the possible effect on the health of workers of new chemical products during their manufacture and on the public health. The laboratory, which is said to be the only one of its kind in the United States, has been named in honor of Mr. Harry G. Haskell, a vice president of the du Pont Company, who has long been interested in the development of the company's medical division. It will be under the supervision of Dr. Wolfgang Felix von Oettingen, medical director, who was formerly assistant professor of pharmacology at Western Reserve University School of Medicine, Cleveland. He will have five assistants in addition to other attendants. In addition to offices, the building contains laboratories for biochemistry, pathology and toxicology, with auxiliaries all completely equipped with the latest appliances and facilities. A complete library will be provided for use in studying toxicologic problems in the field of industrial hygiene.

DISTRICT OF COLUMBIA

Medical Bills in Congress.—S. 31, introduced by Senator Copeland, New York, proposes to direct the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to practice the healing art to Dr. Chester C. Groff. S. 401, introduced by Senator Copeland, New York, has passed the Senate, proposing to substitute the corporation counsel of the District of Columbia for the United States Attorney for the District of Columbia as a member of the Commission on Licensure to Practice the Healing Art in the District of Columbia, and to put prosecutions and all proceedings under the act in the hands of the corporation counsel instead of the United States attorney.

GEORGIA

New Auditorium for District Meeting.—The meeting of the Sixth District Medical Society, December 5, marked the informal opening of a new auditorium sponsored by the Macon Hospital Commission and the Bibb County Medical Society in Macon. The building, once a church, was taken over by the Public Health Board of Bibb County and remodeled. The second floor has been renovated to form the auditorium, with funds provided by the hospital commission and the county medical society. Speakers at the district society meeting included Drs. Charles N. Wasden, Macon, on iodine in the treatment of diseases of the thyroid gland; John M. Sigman, Macon, treatment of acne without scarring; Olin H. Weaver, Macon, ectopic pregnancy; Henry D. Allen Jr., Milledgeville, iron deficiency anemia, and Guy T. Bernard, Augusta, skin cancer.

Society News.—Dr. Charles W. Roberts, Atlanta, presented a paper on "Concurrent Osteogenic Sarcoma in Brother and Sisters" before the Fulton County Medical Society in Atlanta, December 6.——Dr. William T. Randolph, Winder, addressed the Jackson-Barrow Counties Medical Society, November 5, in Jefferson, on amebic dysentery.——Dr. John E. Walker, Columbus, discussed "Classification and Treatment of Anemia" before the Third District Medical Association at Cordele, November 7; a symposium on cardiovascular disease was presented by Drs. John R. Rose, Unadilla; Thomas E. Rogers, Macon; Charles H. Richardson, Macon, and James E. Paullin, Atlanta. ——Drs. James M. Byne and Robert L. Miller, both of Waynes-

boro, presented a symposium on gonorrhea, among other speakers, before the Burke-Jenkins-Screven Counties Medical Society at Millen, November 1.

ILLINOIS

Quarantine Lifted at Veterans' Facility.—The quarantine that had been in effect for ten days at the U. S. Veterans' Facility at Hines because of an epidemic of influenza was lifted, January 9.

Vaccines Distributed by the State.—Figures from the state health department for the first eleven months of 1934 indicate that the demand for preventive vaccines increased as compared with other years. Nearly twice as much typhoid vaccine was distributed as in any previous year, enough to immunize 63,548 persons as compared with a previous high of 38,425. Sufficient toxoid to immunize more than 200,000 children, nearly twice the amount given out in 1933, vaccine to protect 165,490 persons against smallpox, and enough silver nitrate solution to give prophylactic treatment against eye infection to 103,708 new-born babies were distributed. Antirabic vaccine to treat 1,713 persons bitten by dogs and sufficient material to give the Schick test to 65,785 persons were furnished by the department.

Tumor Clinic at Veterans' Hospital.—A tumor clinic was conducted at the Veterans' Administration Facility at Hines, January 14, under the direction of Dr. Max Cutler, head of the tumor clinic at Michael Reese Hospital, Chicago, and consultant in tumors to the facility. Following the presentation of cases, Aristid V. Grosse, Ph.D., professor of chemistry, University of Chicago, spoke on "Recent Advances in Radioactivity and Artificial Radioactivity." An evening program was presented by the following physicians:

Charles M. Griffith, medical director, U. S. Veterans' Administration, Washington, D. C., The Cancer Problem in the Veterans' Administration.
Max Cutler, Tumors of the Breast—Diagnosis and Treatment.
Walter C. Alvarez, associate professor of medicine, University of Minnesota School of Medicine, Rochester, Cancer of the Digestive Tract.

A new specially constructed two gram radium "bomb," valued at $100,000, was displayed during the meeting.

Chicago

Personal.—Dr. Karl Meyer, medical superintendent of Cook County Hospital, has been named chief of the surgical staff of Henrotin Hospital; he will continue his duties at the county institution, with which he has been associated for twenty-one years.

General Practitioner's Night.—The Chicago Medical Society has designated its meeting, January 23, "General Practitioner's Night." Speakers will be Drs. Hart E. Fisher, chief surgeon, Chicago Rapid Transit Company, on "Treatment of Shock in Electrical Burns"; Stanley J. Seeger, head of surgical department, Milwaukee Children's Hospital, "Recent Advances in the Treatment of Burns," and Sumner L. S. Koch, associate professor of surgery, Northwestern University School of Medicine, "Surgical Repair of Tissue Defects and Deformities Following Burns."

Animal Experimentation Commended.—Sir Frederick Grant Banting, professor of medical research, University of Toronto Faculty of Medicine, approved the ordinance which permits unclaimed animals at the city pound to be used for experimentation, in a recent letter to the Illinois Society for the Protection of Medical Research. He stated that his research resulting in the discovery of insulin would have been impossible had he not been able to use dogs. The use of unclaimed dogs from the city pound for medical research was approved in a resolution adopted by the Chicago Heart Association at its annual meeting, January 8. The association declared itself opposed to the pending Nelson amendment, which would prohibit this use, and favored the continuance of the Arvey ordinance. Dr. Anton J. Carlson, professor of physiology, University of Chicago, was the principal speaker at the meeting.

Society News.—At a meeting of the Chicago Neurological Society, January 17, W. R. Ingram, Ph.D., and Charles Fisher, Ph.D., spoke on "Relation of Hypothalamicohypophyseal System to Diabetes Insipidus"; Dr. George W. Hall and George V. LeRoy, "Narcolepsy Following Head Injuries," and Dr. Roland P. Mackay, "Simultaneous Occurrence of Ependymoblastoma and Osteoblastoma in the Fourth Ventricle."——A feature of the program before the Chicago Gynecological Society, January 18, was the report of the maternal welfare committee: Drs. Charles C. Rentfro on "Incidence of Ectopic Pregnancy in the Reporting Hospitals of the City of Chicago" and William Harcourt Browne, "Ectopic Deaths in Chicago for 1935."——Speakers before the Chicago Society of Allergy, January 21, will include Dr. Michael Zeller on "Woods' Filter in the Diagnosis of Skin Reactions."——Dr. Arnold Knapp, New York, will address the annual meeting of the Chicago Ophthalmological Society, January 21, on "Present Operative Treatment of Detachment of the Retina in Europe."

INDIANA

Personal.—Dr. Bryce B. Reeve, Whiting, chief surgeon of the Standard Oil Company of Indiana, has been placed in charge of the company's medical department.——Dr. John R. Miller, Indianapolis, has been named a member of the prison medical staff at Michigan City, succeeding Dr. George H. Brunner, resigned.

Society News.—A symposium on nervous and mental diseases will be presented before the Indianapolis Medical Society, January 22, by Drs. Charles P. Emerson, Max A. Bahr and Larue D. Carter. Dr. Norman M. Keith, Rochester, Minn., will conduct a clinic on the management of renal disease and discuss "Types of Renal Disease and Their Clinical Significance."——The Cass County Medical Society was addressed in Logansport, December 21, by Dr. Caryle B. Bohner, Indianapolis, on "Modern Allergy."——At a meeting of the Jefferson County Medical Society in Madison, December 3, Dr. Robert L. Kelly, Louisville, discussed skin diseases.——Dr. Kellogg Speed, Chicago, addressed the Allen County Medical Society in Fort Wayne, December 18, on fractures.——At a meeting of the Madison County Medical Society in Anderson, December 17, Dr. Frank F. Hutchins, Indianapolis, discussed "Nervous Symptoms and Their Mechanism."——Speakers before the Knox County Medical Society in Vincennes, December 11, were Drs. Walter J. Leach, New Albany, Heilman C. Wadsworth, Washington, and Mr. Thomas A. Hendricks, Indianapolis; they discussed health insurance.——Speakers before the nineteenth annual meeting of the Indiana Society of Mental Hygiene, December 7-8, included Drs. Franz G. Alexander, Chicago, and Frank F. Hutchins, Indianapolis, on "Psychiatric Approach to Community Welfare Problems" and "Fear Reactions," respectively.

KANSAS

Bills Introduced.—S. 22 and H. 22 propose to repeal the laws regulating the sale and possession of narcotic drugs and to enact the uniform narcotic drug act. S. 31 proposes that, before applicants for licenses to practice any form of the healing art may present themselves to their respective professional boards for examination, they must pass examinations in anatomy, physiology, pathology, bacteriology and hygiene, to be given by a board of basic science examiners, consisting of two members of the faculty of any university or college in Kansas accredited by the University of Kansas, one nonsectarian practitioner, one osteopath and one chiropractor.

MASSACHUSETTS

Dr. Mahoney Reappointed.—Dr. Francis X. Mahoney, health commissioner of Boston since 1922, has been reappointed, his term to expire April 1, 1938.

Bills Introduced.—S. 60 proposes to forbid the admittance of unvaccinated children to private schools. H. 351, to amend the pharmacy practice act, proposes that the provisions of the act shall not apply to the manufacture or sale of patent and proprietary medicines, provided those intended for internal use do not contain salicylic acid, barbituric acid, acetanilid, phenol, bromine, iodine, or their salts or derivatives. H. 62, to amend the law prohibiting the divulging of hospital, dispensary, laboratory and morbidity reports and records pertaining to gonorrhea or syphilis, proposes that the law shall not prevent a physician from informing the husband or wife of a patient with venereal disease when in the opinion of the physician that may be necessary to protect the other spouse or the children. H. 447 proposes to accord to physicians, treating persons injured through the negligence of another, liens on any judgments, settlements or compromises accruing to the injured persons because of their injuries. H. 528 proposes (1) to require the consent of a patient before a physician may remove any organ of his body and to require the physician to submit to the patient a written explanation as to the necessity of its removal, and (2) to require the preservation of any organ so removed until the patient directs its disposal. H. 623 proposes that no person shall be required to submit to vaccination as a condition precedent to admission to any school or public institution or to the exercise of any right, performance of any duty, or enjoyment of any privilege. H. 352 proposes to repeal the laws regulating the sale and possession of narcotic drugs and to enact the uniform narcotic drug act.

MICHIGAN

Bill Introduced.—H. 1 proposes to authorize the State Hospital Commission to establish a branch of the Ionia State Hospital at Jackson state prison.

Personal.—Dr. Foster A. Fennig has been appointed prison physician of the Michigan State Branch Prison at Marquette, succeeding the late Dr. Lowell L. Youngquist.——Dr. Frances A. Ford, formerly an associate in the department of roentgenology at the Mayo Clinic, has been appointed full time director of the department of radiotherapy of Woman's Hospital, Detroit, effective January 1.

Society News.—The Wayne County Medical Society devoted its meeting, December 17, to a discussion of medical economics problems in Detroit and Wayne County.——The staff of the East Side General Hospital was host to the East Side Medical Society, December 6; the speaker was Dr. Robert B. Kennedy on extraperitoneal abdominal cesarean section in infected obstetric patients.——Dr. Arthur M. Culler, Dayton, Ohio, addressed the Detroit Ophthalmological Club, December 5, on "Fever Therapy in Syphilis."——Dr. Nathan J. Bicknell, Detroit, showed pictures of his recent trip to Russia to the Dearborn Medical Society, January 10.——A joint session of the Michigan Pathological Society and the Detroit Radiological Society will be held February 9; "Tumors of Bone Marrow and Lymph Glands" will be discussed.——Dr. Morris Fishbein, Chicago, addressed the Northwestern Dental Society in Detroit, January 8, on "Group Practice."——Dr. Frederick A. Coller, Ann Arbor, discussed "The Management of Gallbladder Disease" before the Kalamazoo Academy of Medicine, December 18.

Joint Program on Tumors.—A joint meeting of the Michigan Association of Roentgenologists, Detroit Branch of the American Urological Association, the Detroit Roentgen-Ray and Radium Society and Michigan Society of Pathologists was held at Harper Hospital, January 17-18. Speakers at the first session were Drs. Bernard H. Nichols, Cleveland, on "Diagnosis of Tumors of the Urinary Tract" and Charles A. Waters, Baltimore, "Treatment of Tumors of the Urinary Tract, More Especially of Renal Tumors." The discussers were Drs. Frank W. Hartman, Detroit, the pathologic aspect; Hans A. Jarre, Detroit, the diagnostic, and Harry W. Plaggemeyer, Detroit, the surgical. The morning session was given over to a symposium on malignancy. Henry F. Vaughan, Dr.P.H., health commissioner of Detroit, presented the introductory talk on "Responsibilities and Opportunities of the Board of Health in Malignancy." Other speakers were:

Dr. Osborne A. Brines, Detroit, Responsibilities and Opportunities of Medical Organizations in Malignancy.
Drs. H. Wellington Yates, Detroit, and Frank L. Rector, Evanston, Ill., The Function of the American Society for the Control of Cancer.
Dr. Plinn F. Morse, Detroit, Pathologic Aspects of Malignancy.
Dr. George T. Pack, New York, Surgical Aspects of Malignancy.
Dr. George E. Pfahler, Philadelphia, Roentgenologic Aspects of Malignancy.

MISSISSIPPI

Personal.—Dr. James T. Googe, health officer of Copiah County, has resigned to become assistant state health director of Florida, it is reported. Dr. Googe has been health officer of Copiah County for only a short time, having previously occupied a similar position in Holmes County. His new appointment was effective January 1. Dr. John W. Dugger, Jackson, has been temporarily appointed to succeed Dr. Googe.

MISSOURI

Society News.—At a meeting of the Adair County Medical Society in Kirksville, November 16, Drs. Joseph Hoy Sanford and Howard A. Rusk, St. Louis, spoke on "Obscure Abdominal Pain: Importance of the Urinary Tract in the Investigation" and "Obesity: Present Status and Management," respectively.——Dr. Owen H. Wangensteen, Minneapolis, addressed a joint meeting of the Jackson County Medical Society with the Wyandotte County Medical and Kansas City Southwest Clinical societies, January 8; his subject was "Practical Aspects of the Therapeutic Problem in Bowel Obstruction."

Advisory Committee Appointed.—A medical advisory committee was appointed, November 27, to assist the St. Louis County League of Municipalities in dealing with such problems as sewers, milk inspection, smoke abatement and coordination of the St. Louis County Hospital and Health Department, newspapers report. Members of the committee include:

Dr. Emmett P. North, St. Louis, president, state board of health.
Dr. Fred W. Bailey, Kirkwood.
Dr. Leith H. Slocumb, Ferguson.
Dr. Paul E. Rutledge, Kirkwood.
Dr. Carl C. Irick, health commissioner of Webster Groves.
Dr. Andrew J. Signorelli, health commissioner of Clayton.
Dr. Oscar P. Hampton Jr., health commissioner of University City.
Dr. John O'Connell, Overland, president, St. Louis County Medical Society.

NEW HAMPSHIRE

Bill Introduced.—H. 12 proposes to require a physician or hospital treating a person suffering from gunshot wounds or other injuries of unusual character to ascertain from such patient the cause of his wounds and to report the facts as soon as possible to the police of the town or city in which such treatment is given.

NEW YORK

Personal.—The medical board of Peekskill Hospital gave a testimonial dinner, November 19, in honor of Dr. Ray W. Moe, who retired as president of the board.——Dr. Brooks W. McCuen, Syracuse, was elected president of the Association of New York Central Lines Surgeons at the annual meeting in New York in November.——Dr. Robert M. Ross has been appointed superintendent of Brigham Hall Hospital, Canandaigua, succeeding the late Dr. Henry C. Burgess.

Bills Introduced.—S. 19 and A. 19, to amend the workmen's compensation act, propose, among other things, (1) to authorize the industrial commissioner to establish a schedule of fees for medical care rendered injured employees; (2) to authorize the commissioner to establish a panel of physicians to render the medical care required by the act, the employee to have the right to select any physician on that panel to treat him; (3) to provide that no claim for specialists' consultations, surgical operations or physiotherapeutic procedures costing more than $25, nor roentgen examinations or special diagnostic laboratory tests costing more than $10, shall be paid unless such special services are rendered in an emergency or have been authorized by the employer or by the commissioner; (4) to provide that a physician rendering service to a compensation claimant may recover for his services only under the provisions of the act, and (5) to increase the industrial council from ten to fifteen members, five of whom shall be licensed physicians. S. 20 and A. 20, to amend the workmen's compensation act, propose to make compensable any disabling disease or illness acquired in any employment covered by the act. A. 61, to amend the law authorizing the annulment of marriages, proposes to authorize an annulment if either spouse has been incurably insane for three years or more. S. 155 proposes that no municipality, water district, corporation or company shall install a water purification or treatment plant for public use, nor make alterations of or extensions of any water purification or treatment plants that may affect the sanitary quality of the water supply, unless the plans are approved by the state department of health.

New York City

Personal.—Dr. Thomas Horace Evans, formerly associate professor of anatomy at Long Island College of Medicine, has been elected research professor of anatomy at New York Homeopathic Medical College and Flower Hospital.——Dr. Ignatz L. Nascher, chief physician of the department of hospitals, retired under the age limit rule January 1 after nearly twenty years' service with the department of public welfare and hospitals.——Dr. Charles L. Christiernin has been appointed medical director of the Metropolitan Life Insurance Company to succeed Dr. Augustus S. Knight, who retired, December 31, after forty-two years of service. Dr. Christiernin has been assistant medical director since 1916.

Montefiore Hospital Celebrates Fiftieth Year.—Clinical conferences were held throughout the week of December 3 at Montefiore Hospital for Chronic Diseases as part of the observance of the fiftieth anniversary of the hospital's founding. A scientific exhibit of pathologic specimens, technical apparatus and photographic work was on display in the hospital's medical library and a further celebration was an anniversary dinner at the Waldorf-Astoria, December 6. A group of New York citizens established the hospital in 1884 in honor of the one hundredth birthday of Sir Moses Montefiore, British philanthropist. It has expanded from twenty-five beds in a rented house to its present capacity of 742 beds with a country sanatorium in Westchester County of 235 beds.

OHIO

Dinner to Dr. Bachmeyer.—More than 250 friends and colleagues of Dr. Arthur C. Bachmeyer, who recently left Cincinnati to become director of the University of Chicago Clinics, gathered at the Netherland Plaza Hotel, December 11, at a farewell banquet in his honor. Among those who paid tribute to Dr. Bachmeyer were Mayor Russell Wilson, City Manager C. A. Dykstra, Rev. Frank H. Nelson, President Raymond Walters of the University of Cincinnati, and Dr. Alfred Friedlander, who succeeded Dr. Bachmeyer as dean

of the university school of medicine. Dr. Bachmeyer was dean for nine years and superintendent of the Cincinnati General Hospital for twenty years.

Warning Against Impostor.—A man calling himself Dr. William H. Haid, Aurora, is reported to be collecting money under false pretenses in the vicinity of Cleveland. He presents letters addressed to "Dr." Haid and gives checks on the Second National Bank of Ravenna. He claims to be working for the Portage County health department in malaria control. If such a person calls, physicians are asked to notify the Cleveland Retail Credit Men's Association, National City Bank Building, Cleveland. It seems that a man of this name appeared at various times during 1931 in Maywood, Ill., Pontiac, Mich., and Boston. On a card sent to the American Medical Association Haid claimed that he had graduated from the "University of Kentucky School of Medicine" in 1927. There is no school of this name. At other times he claimed graduation from the University of Tennessee School of Medicine and the University of Illinois School of Medicine. Inquiry of these two schools and of the University of Louisville School of Medicine revealed that no person of the name William H. Haid had ever been registered at any of the schools. The newspapers reported that a William H. Haid, who once held a position with the Chicago department of health, was arrested in Boston in 1931 on a charge of passing worthless checks and sentenced to serve a month in the house of correction.

OKLAHOMA

Dermatologic Meeting.—The Oklahoma Dermatological Society held its semiannual meeting in Oklahoma City, December 11, with Dr. Louis H. Ritzhaupt, Guthrie, president-elect of the Oklahoma State Medical Association, as guest speaker, on pending medical legislation. Dr. Ritzhaupt is a member of the legislature. Dr. Everett S. Lain, Oklahoma City, gave an address on "The Relations of Calcium Metabolism to Dermatologic Manifestations." Clinics were held in the afternoon at Crippled Children's Hospital.

Society News.—The Okfuskee-Okmulgee County Medical Societies were addressed at Henryetta, December 17, by Drs. Leonard S. Willour, McAlester, on "Medical Care for the Indigent"; E. Rankin Denny, Tulsa, "Conservative Treatment of Peripheral Vascular Disease," and Ned R. Smith, Tulsa, "Diagnosis of the Major Psychoses."——Dr. Tolbert B. Hinson, medical director and owner of the Enid Springs Sanitarium and Hospital, Enid, was elected president of the Oklahoma State Hospital Association at the annual meeting in November.

OREGON

Society News.—Dr. William M. Wilson, Portland, addressed the Central Willamette Medical Society, Albany, November 1, on "Treatment by Alcohol Injection of Pruritus Vulvae, Chronic Vulvitis and Leukoplakic Vulvitis."——Dr. Lyle B. Kingery, Portland, addressed the Lane County Medical Society, Eugene, November 15, on "Diagnosis and Treatment of the Commoner Skin Diseases."——Dr. William W. P. Holt, Medford, read a paper on recent advances in pediatrics before the Jackson County Medical Society, Ashland, November 7.

PENNSYLVANIA

Personal.—Dr. Annie R. Elliott, chief of the women's department of the Norristown State Hospital for twenty-two years, has been appointed superintendent of the hospital to succeed the late Dr. Solomon Metz Miller.

Hospital News.—A new building restoring the Robert Packer Hospital, Sayre, which was damaged by fire in May 1933, was opened December 6. The main building is eight stories high, with a solarium floor in addition and also a tower in which air conditioning apparatus and elevator equipment are housed. A promenade deck on the roof overlooks the Susquehanna Valley. There is also a two-story portion connected to one of the older wings.

Philadelphia

Lectures for Parents of Diabetic Children.—The Philadelphia Metabolic Association is sponsoring a course of six lectures for parents of diabetic children. The series, which began January 10 and will continue for six consecutive Thursday evenings, is presented by Miss Anna O. Stevens, formerly of the staff of Geisinger Hospital, Danville, who has had wide experience with diabetic children.

Personal.—Dr. Edward Lodholz, Isaac Ott professor of physiology, University of Pennsylvania Graduate School of Medicine, received the 1934 award of honorary membership in the Philadelphia Academy of Stomatology at the society's annual dinner recently.——Dr. and Mrs. McCluney Radcliffe celebrated the fiftieth anniversary of their wedding, January 1, at a tea at the Bellevue-Stratford Hotel.

Meeting of Otolaryngologists.—The section on otolaryngology of the New York Academy of Medicine met with the corresponding section of the College of Physicians of Philadelphia, January 16; speakers were Drs. Max M. Strumia, on "Importance of the Schilling Count as a Diagnostic and Prognostic Indicator in Infections of the Ear, Nose and Throat"; Oscar V. Batson, "The Veins of the Base of the Skull and Their Relation to Otolaryngology," and Chevalier Jackson, "Defective Surgical Instruments as an Avoidable Cause of Foreign Body Accidents."

Society News.—Dr. Charles F. McKhann, Boston, among others, addressed the Philadelphia Pediatric Society, January 8, on "Immune Globulin from Placentae in the Attenuation and Prevention of Measles."——Speakers at a meeting of the Pathological Society of Philadelphia, January 10, were Drs. Harold L. Stewart and Abraham Cantarow, "Morphologic and Functional Changes Associated with Reestablishment of Bile Flow in Cats with Experimental Common Duct Obstruction"; Dr. John A. Kolmer and Miss Anna M. Rule, "Vaccination Against Experimental Pneumococcus Infections," and Dr. Thomas Francis Jr., New York, "Localization and Development of the Lesions in Experimental Pneumonia."

RHODE ISLAND

Bill Introduced.—H. 531 proposes to create a state board of examiners in naturopathy and to legalize the practice of naturopathy. The bill defines naturopathy as follows: "A science dealing with the diagnosis and treatment of disease through natural therapeutics. It shall embrace and include physiological, mechanical and dietetic sciences, such as mechanotherapy, electro-therapy, use of diet and herbs including powdered and dehydrated foods and fruits, and other methods as taught in the various recognized schools of naturopathy, excepting, however, surgery and the prescription of compounded drugs."

TENNESSEE

Society News.—Drs. Peter Whitman Rowland Jr. and Carrol C. Turner, Memphis, addressed the Gibson County Medical Society, Trenton, November 26, on diagnosis of rheumatoid arthritis and hemorrhage of the brain, respectively.——Dr. William O. Floyd, Nashville, addressed the Davidson County Medical Society, December 4, on "Surgery of the Biliary Tract in the Jaundiced Patient."

Bills Introduced.—S. 30, H. 45 and H. 48, to reorganize the department of public health, propose that the board of health shall consist of nine members, six of whom shall be licensed physicians, one a licensed dentist, one a licensed pharmacist, and one a member of the Tennessee Congress of Parents and Teachers and the Tennessee Federation of Women's Clubs. The medical members of this board are to be appointed by the governor from a list of six from each grand division of the state, certified to the governor by the house of delegates of the Tennessee State Medical Association.

Portrait of Dr. McElroy.—At commencement exercises of the University of Tennessee School of Medicine, Memphis, December 19, a portrait of Dr. James Bassett McElroy, head of the department of medicine, was presented to the university by alumni and members of the faculty. The presentation was made by Dr. James Lindsay Andrews and the acceptance address by Mr. Wassell Randolph, a trustee. Dr. McElroy came to Memphis in 1905 as chief of the dispensary and a lecturer in physical diagnosis at the Memphis Hospital Medical College. Later he became professor of pathology and bacteriology at the college, remaining in that capacity until the school was consolidated with the University of Tennessee.

WEST VIRGINIA

New Laboratory Ruling.—The state health commissioner has recently ruled that Wassermann or Kahn tests will be made by the state laboratory hereafter only when the specimen is sent by a physician. In the past, patients have occasionally been sent to the laboratory and have frequently obtained their own reports. In the future, reports will be sent directly to the physician and not given to the patient under any circumstances.

Society News.—Dr. Robert D. Roller Jr., Charleston, addressed the Kanawha Medical Society, Charleston, December 9, on pulmonary tuberculosis.——Dr. William S. Middleton, Madison, Wis., addressed the Ohio County Medical Society, Wheeling, December 21, on coronary disease.——Dr. Leopold Clarence Cohn, Baltimore, addressed the Eastern

Panhandle Medical Society, at Martinsburg, December 12, on "Newer Methods for the Diagnosis and Treatment of Cancer." —Drs. Walter W. Point and Roy O. Halloran, Charleston, addressed the Raleigh County Medical Society, Raleigh, November 22, on "The Perineum in Labor" and "Common Skin Conditions," respectively.——Drs. Albert E. Goldstein, Baltimore, and Samuel Brown, Cincinnati, presented papers on "Symptomatology and Diagnosis in Urologic Conditions" and "Roentgenogram of the Heart and Great Blood Vessels," at a meeting of the Cabell County Medical Society, Huntington, December 13.

GENERAL

Radiology and Pediatrics Examinations.—The American Board of Radiology announces that an examination will be held on the West Coast about the middle of May. Candidates who wish to appear before the board at that time should send in their applications not later than March 1 to Dr. Byrl R. Kirklin, Rochester, Minn., secretary. The exact date and place will be announced later. The American Board of Pediatrics announces that an examination will be held, November 19, in St. Louis.

Prize for Research in Biochemistry.—Eli Lilly and Company, Indianapolis, has established under the auspices of the American Chemical Society a research award of $1,000 and a bronze medal to stimulate research in biologic chemistry by a young man or woman working in a college or university in the United States, *Science* reports. The nominee for the award must not have passed his thirty-first birthday on April 30 of the year in which the award is made and must have accomplished outstanding research in biologic chemistry. Work in immunology, pharmacology, clinical investigations and experimental therapeutics may not be included in the term biologic chemistry for the purpose of this award.

Medical Bills in Congress.—S. Res. 28, introduced by Senator Black, Alabama, and referred to the Senate Committee on Education and Labor, proposes to direct that committee to make a full and complete investigation to determine the best and most effective kind of federal legislation to provide a system of health insurance throughout the United States and to report to the Senate as early as practicable the recommendations outlining the kind of legislation that will most effectively accomplish the purpose. S. 5, introduced by Senator Copeland, New York, and S. 580, introduced by Senator McCarran, Nevada, and referred to the Senate Committee on Commerce, propose to prevent the manufacture, shipment and sale of adulterated or misbranded food, drink, drugs and cosmetics, and to prevent the false advertisement of such articles. S. 142, introduced by Senator Davis, Pennsylvania, proposes to authorize the President to accept radium, in an amount not exceeding $10,000,000 worth, from the Belgian government in payment of the debt owed by that country to the United States. The radium so accepted, it is proposed, will be donated to hospitals, medical clinics and medical research organizations in the United States. S. 363, introduced by Senator Capper, Kansas, proposes that for the purposes of promotion, longevity pay and retirement there shall be credited to officers of the Veterinary Corps, and former officers of the Veterinary Corps now on the retired list, all full time service rendered by them as veterinarians in the Quartermaster Department, Cavalry or Field Artillery. H. R. 16, introduced by Representative Fulmer, South Carolina, proposes to provide for federal cooperation with the several states in the care, treatment, education, vocational guidance and placement, and physical rehabilitation of "persons under the age of 21 years who have some physical defect such as affections of the joints, affections of the bones, disturbances of the neuromuscular mechanism, congenital deformities, static and other acquired deformities that may be corrected or improved by orthopedic surgery or other surgical and medical care." H. R. 43, introduced by Representative Rudd, New York, proposes to provide that employees of the Postal Service suffering from tuberculosis, nervous diseases or kindred occupational ailments be hospitalized by the United States without cost to the employee. H. R. 174, introduced by Representative Reece, Tennessee, proposes to provide that any veteran, not dishonorably discharged, who is in need of hospitalization, and is unable to defray the expense therefor, may be furnished hospitalization in any Veterans' Administration facility, within the limitations existing in such facilities, on the payment of a per diem fee in an amount equal to the average cost of hospitalization per patient day at the facility for the previous month. H. R. 197, introduced by Representative Buckbee, Illinois, proposes to prohibit untrue, deceptive or misleading advertising through the use of the mails or in interstate or foreign commerce. H. R. 10, introduced (by request) by Representative Celler, New York, H. R. 2827, introduced by Representative Lundeen, Minnesota, and H. R. 2859, introduced by Representative Sabath, Illinois, propose to provide for the establishment of unemployment and social insurance, conferring on the Secretary of Labor the right to provide social insurance for the purpose of paying workers insurance for loss of wages because of part time work, sickness, accident, old age or maternity. H. R. 1425, introduced by Representative Woodruff, Michigan, would authorize the withdrawal of alcohol tax free "for the use of any clinic operated for charity and not for profit, including use in the compounding of bona fide medicines for treatment outside of such clinics of patients thereof, but not for sale." H. R. 1990, introduced by Representative Bland, Virginia, proposes to provide hospitalization for retired or disabled seamen. H. R. 2000, introduced by Representative Pierce, Oregon, proposes to authorize the dissemination of information relating to the prevention of conception, and articles, instruments, substances, drugs and medicines designed, adapted or intended for the prevention of conception, (1) by any physician legally licensed to practice medicine, or by his direction or prescription; (2) by any druggist in filling any prescription of a licensed physician; (3) by any medical college legally chartered; or (4) by any licensed hospital or clinic, except in any state in which such use is prohibited by the law thereof. H. R. 2018, introduced by Representative Griffin, New York, proposes to provide medals of honor and awards to government employees for distinguished service in science or for voluntary risk of life and health beyond the ordinary risks of duty. H. R. 2027, introduced by Representative Harlan, Ohio, proposes to provide additional compensation to World War veterans for the loss of use of an eye in active service in line of duty. H. R. 2773, introduced by Representative Englebright, California, proposes to authorize the erection of a veterans' hospital in the inland region of California. H. R. 2824, introduced by Representative Lundeen, Minnesota, proposes to reenact all laws granting medical and hospital treatment, domiciliary care and compensation to veterans that were repealed by the act of March 20, 1933. H. R. 2902, introduced by Representative Welch, California, proposes to extend the benefits of the United States Public Health Service to fishermen, trapmen, net tenders and other persons subject to the laws relating to American seamen. H. R. 3024, introduced by Representative Hoeppel, California, proposes to provide hospital treatment and domiciliary care to the retired personnel of the armed services.

FOREIGN

Sounding of Automobile Horns Forbidden.—According to the Chicago *Tribune*, a law forbidding the sounding of automobile horns in Rome went into effect, Dec. 17, 1934.

News of Epidemics.—A report to the New York *Times*, January 6, stated that in an epidemic of malaria in Ceylon, it is estimated that 250,000 persons are ill, including many physicians. About 4,000 deaths were said to have occurred in one district. The dispatch said that fifty physicians were on their way to the island from India.——An epidemic of exanthematous typhus was recently reported throughout Chile. The districts principally affected are near Santiago.

Personal.—Dr. Amy M. Fleming, senior assistant in the gynecologic department of the University of Glasgow, has been appointed to succeed Dame Louise McIlroy in the University of London chair of obstetrics and gynecology tenable at the London School of Medicine for Women.——Dr. Otto Naegeli, Zurich, Switzerland, was made an honorary member of the American Society of Clinical Pathologists recently. ——Dr. Malcolm H. MacKeith, who was appointed dean of the new British Post-Graduate Medical School at Hammersmith a year ago, has been forced to resign because of ill health. The staff of the school has been completed and it is expected that it will be open for teaching purposes about April 1. Applications for the position of dean have been thrown open to the general medical profession.——Sir Henry B. Brackenbury was recently reelected to the General Medical Council for a term of five years representing the general medical practitioners resident in England.——Sir Henry Wellcome was decorated with the Cross of the Legion of Honor of France, November 23. ——The Copley Medal of the Royal Society of England has been awarded to Prof. John S. Haldane in recognition of his research on human physiology. With the king's approval a royal medal has been awarded to Dr. Edgar Douglas Adrian for his work on the physiology of nerve and its application to the problem of sensation.——Dr. Leslie J. Witts has been appointed professor of medicine and Dr. Geoffrey Hadfield of the University of Bristol, professor of pathology at the University of London tenable at St. Bartholomew's Hospital Medical College.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 22, 1934.

Physicians Must Broadcast Anonymously

The General Medical Council (the body appointed by the government to control medical education and the conduct of physicians) made a regulation in 1932 that, when in the interest of education or information of the public, it is desirable or necessary that matter concerning medicine or public health should be broadcast, the person broadcasting and his remarks should be approved by a physician nominated for the purpose by the Ministry of Health. This regulation has now been rescinded and the council has decided that physicians must broadcast anonymously, that correspondence addressed to them should not be forwarded, and that their anonymity must be strictly observed in connection with any inquiries relevant to them or their talks. Also the Council is to be furnished after the event with names of the broadcasters and the text of their matter. The basis of the Council's action is that anything in the nature of advertising by a physician is strictly forbidden. What he does in broadcasting must not be susceptible of being construed as "advertising, whether directly or indirectly, for the purpose of obtaining patients or promoting his own professional advantage."

The Mortgaging of Insurance Practices

A procedure that has sprung up in the north of England, of physicians buying panel practices by mortgaging them to money lenders, has engaged the attention of the Insurance Acts Committee of the British Medical Association. The chairman, Dr. H. G. Dain, has referred to the detrimental effect on the service of a commercial interest in a practice by lay people and to a scheme whereby physicians with little or no capital might obtain under proper auspices loans for the purchase of a practice. In some parts of the north of England it is said to be difficult to purchase a practice from a physician, because the financial corporations get in first and offer cash down. They also circulate newly qualified men, pointing out how easy it is to purchase a practice as they provide the money. The procedure has a bad influence on the efficiency of the service. The financial corporation makes tempting offers to sellers and therefore imposes onerous conditions on buyers, who may have difficulty in fulfilling their obligations and resort to canvassing and the easy issue of certificates in order to get patients. On the other hand, it has been suggested that in such cases, when the practice is really owned by the money lender and the physician is in the position of a salaried servant, unethical transgressions are less likely because he is not seriously concerned to enlarge the practice so long as he obtains his salary regularly. The committee is endeavoring to frame a scheme with a medical insurance agency for the purchase of practices whereby, reasonable security being afforded, the whole of the money might be provided under terms not too onerous or likely to commercialize the practice. Young physicians would thus be saved from the speciously attractive propositions of financial corporations.

A Medical Trade Union

The Medical Practitioners' Union is a trade union, which was formed in 1915 by physicians who thought that an organization on these lines, which have never been adopted by the British Medical Association, was desirable. It is a smaller body and has nearly 6,000 members. It has joined forces with the other labor unions. The General Council of the Trades Union Congress has accepted the proposal of the Medical Practitioners' Union for affiliation. This is the first time that a medical society has been linked up with the Trades Union Congress. In a press interview the secretary of the union stated that the object of this move is mainly to protect members who are engaged by county and municipal authorities. "Where negotiations are needed," he said, "it will give added strength but it must not be taken that this affiliation means the possibility of a strike against the sick. Every union affiliated with the Trades Union Congress is governed by its own rules and that, of course, applies to us. It is unthinkable that there should be a strike against people who are ill, nor would anybody expect doctors to take such a step. We are endeavoring to help many members of our union, and to do that we have had to apply wholly as a union." It is one of the objects of the trade unions to be able to declare a general strike, and one actually took place a few years ago but was unsuccessful. The government was equal to the emergency and essential services were maintained by volunteers. It is understood that the application from the Medical Practitioners' Union was accepted without qualification, no specific point being raised on the question of a general strike. The calling out of the physicians in the case of another general strike would be the reductio ad absurdum of trade unionism. The majority of the physicians in this country abhor this movement by a section of the profession. It is certainly due to the great increase of state interference in medical practice in recent years, of which the most important manifestation is health insurance of the wage earners. The idea is, as indicated, to confront the state or the local authorities who employ physicians by a powerful organization.

THE POSITION OF THE BRITISH MEDICAL ASSOCIATION

The question has arisen Can these medical trade unionists retain membership in the British Medical Association, which is opposed to anything that savors of the political? In a press interview the secretary of the Medical Practitioners Union said that they were not concerned with politics but only with medical politics—a vastly different thing. Both organizations were voluntary bodies, and physicians could be members of both, just as they could be members of two golf clubs. He saw no reason why the two bodies should clash. However, Dr. Anderson, medical secretary of the British Medical Association, has expressed a different view in another press interview. He agreed that physicians may still subscribe to membership in both organizations but said: "They must be men of elastic conscience. Personally I could not do it, because I do not believe in the union's methods. In affiliating with the trade unions they are trying to anticipate the political movement in this country. [He evidently refers to a possible victory of the labor party.] The union will alienate the sympathies of a good many of its members by this move. The British Medical Association does not need to be a trade union to fulfil its objects. Nearly 60 per cent of the profession are members of the association and the turn of events does not perturb us in the least."

Radiologic Examination of the Gastro-Intestinal Tract

At the section of radiology of the Royal Society of Medicine, Dr. B. R. Kirklin of the Mayo Clinic, Rochester, Minn., read a paper in which he stated that only by x-rays could the earliest cancerous growths of the alimentary tract be found. Also, certain nonmalignant growths could be found and treated with greater success early than late. Hemorrhage was an urgent indication for radiologic investigation. Peptic ulcer was so often the cause that it might be the only condition considered by the clinician, but, as he showed by a series of cases, other conditions, such as a small growth in the esophagus, might be the cause. Unless radiologic examination was carried out so as to permit direct frontal inspection, small gastric lesions would escape observation. He made a complete study of the

mucosal pattern after the first swallowings of barium. Bleeding from the rectum called for careful examination of the colon. In one case the double contrast method (air insufflation following a barium enema) showed a polypoid growth in the sigmoid, which proved to be adenocarcinoma. In every case of unexplained or idiopathic anemia a radiologic study of the gastro-intestinal tract should be made. In cases of loss of weight without other objective manifestations, radiologic examination should be one of the first tests.

PARIS

(From Our Regular Correspondent)

Jan. 28, 1935.

French Orthopedic Congress of 1934

The French Orthopedic Congress of 1934 was held at Paris, October 12, the chief subjects for discussion being the surgical treatment of the funnel-shaped thorax and that of the paralyses due to Little's disease. The first of these two subjects was covered in the paper of Dr. Charles Garnier of Paris. Until recently this deformity had been treated by external measures; i. e., apparatus alone. The paper was based on nine cases observed in the large orthopedic service of Professor Ombredanne. The chief indications for surgical intervention were (*a*) dyspnea due to the fact that the expansion of the chest during respiration was limited to its upper segment, and (*b*) cardiac symptoms due either to direct compression of the heart or its displacement toward the left with consequent torsion of the vessels.

These pulmonary and cardiac symptoms do not improve with nonoperative treatment in many cases, and the lung condition predisposes to the development of tuberculosis. Such children should be operated on before the fifth year. In older children and adults the operation is much more difficult.

The sternum is mobilized in two steps. First the left costal cartilages (the third to the eighth) are resected for a distance of 2 cm. each, and six days later those of the right side. Gentle traction is applied to the sternum and a cast, which is left for two months. The functional results have been far more satisfactory than the morphologic. The mortality in nine cases has been 18 per cent. One can either resect the costal cartilages as just described or divide the sternum longitudinally.

In the discussion, Froehlich of Nancy stated that the indications for operation should be carefully considered. The operative treatment is indicated if there are evidences of serious pulmonary or cardiac lesions, if these cannot be ascribed to other causes than the funnel-shaped thorax.

Mathieu reported three cases. In adults, he resects all the costal cartilages except the first and second. There was marked immediate improvement in all of the three cases. Whether this will be permanent, it is impossible to say.

Richard and Dupuis reported two cases. In one, the gap in the divided sternum (second method of Ombredanne) was held open by three bone grafts from the tibia. Postoperative respiratory exercise is very important.

Perrot of Geneva also reported two cases, one in a boy of 18 and the other in a boy of 7. The functional symptoms had completely disappeared in both cases.

The second paper, on treatment of spastic paralyses (Little's disease and encephalopathies), by Delchef of Brussels and Roudil of Marseilles, reviewed thoroughly the anatomy and the physiopathology. The only prophylactic measures were to treat a maternal syphilis, to avoid trauma during delivery and, as early as signs of hereditary syphilis appear, to treat this vigorously. After the lesions have developed, the only medical treatment is to administer antisyphilitic preparations. In addition to reeducation, which, when employed alone, helps the milder cases, much depends on the stage of the disease. The Stoffel operation is beneficial when there is a spastic condition but is of no avail when there is muscular retraction. Here only some form of tendon operation, either tenotomy or elongation of the tendon, preferably the latter, is indicated. The location of the spasm is an important consideration. If there is flexion-pronation deformity of the wrist and fingers, only tendon elongation or transplantation or a Stoffel operation is indicated, whereas, if there is an equinus deformity of the foot, a tenoplasty is necessary to correct it. In general, the lack of mental development and the tendency to hypertonicity of the choreoathetotic movements seriously complicate the problem of treatment. One must never forget that there is a tendency to spontaneous amelioration of the disease. Each case requires individual study.

Hygiene of Natatoriums at Seaside Resorts

At the recent hygiene congress in Paris, des Essarts called attention to the unhygienic conditions existing in the swimming pools containing water pumped directly from the ocean, which now exist at some of the large seaside resorts in France. The water in these pools is not only polluted by sewage, which is discharged near the source of supply for the pools, but is also contaminated by the thousands of persons who prefer to use the pools instead of bathing in the adjacent ocean. No effort is made to change the sea water in the pools at frequent intervals and no disinfectants are employed. Hence the water acts like a culture medium, especially for the colon bacillus. This explains why one so often sees individuals who have patronized the pools afflicted with conjunctivitis, otitis, gastroenteric syndromes, typhoid dysentery and various skin diseases.

A plea was made for more rigid control of this innovation at seaside resorts. The water ought to be taken at a point where there is no likelihood of contamination, and chlorinization of the water in the pools must be insisted on.

Professor Faure Retires from Hospital Service

Jean-Louis Faure, professor of gynecology at the Paris Medical School, was presented with a medal, November 18, by a large number of colleagues, friends and former patients. This event marked his retirement from many years of service at the Broca Hospital. He is one of the leaders of abdominal surgery in France, and his contributions to gynecology have made the name of Faure known all over the world. In response to many addresses by leaders of the literary and scientific world, Professor Faure stated that he had lived during the epoch of development of the technic of abdominal surgery. The coming generations will never see a more glorious period of the evolution of surgery. Perhaps surgery will be partly replaced by radiotherapy and other measures in the future. There is a tendency at present to place too much reliance on laboratory work and to neglect somewhat the clinical side. The patient should be spared from too many laboratory tests, some of which are superfluous.

Effect of High Temperatures on the Testis

An experimental study of why the testis fails to develop when retained within the abdomen, as observed in cases of experimental cryptorchidism, was reported before the Biologic Society, October 20, by Jolly and Lieure. They do not agree with the theory of Moore that the scrotum is a regulator of temperature and that, as his experiments show, the testes fail to develop when placed in the abdominal cavity, where the temperature is higher. These authors employed guinea-pigs (from 3 to 4 months old) the testes of which had fully matured. The testes were exposed for periods varying from ten minutes to one hour in water at a temperature ranging from 40 to 48 C. The testes were examined microscopically from fifteen to thirty-five days after such exposures. No effects were observed at temperatures from 40 to 43 C. and only slight changes up to 46 C. When a higher temperature was reached, from 46 to

48 C., marked but not diffuse effects were noted. They do not believe that the intra-abdominal temperatures in experimental animals ever rise high enough to affect the development to maturity of the testis, so that one must look elsewhere for a cause to explain the nondevelopment of the testis in cryptorchidism, at least so far as experimental study is concerned.

Treatment of Diphtheria

At a November meeting here, the treatment of diphtheria was discussed by some of the leading clinicians and bacteriologists of Paris.

Louis Martin, director of the Pasteur Institute, made an appeal for the use of antitoxin at the earliest possible moment, and not to wait for the appearance of false membranes. Intravenous injection acts more rapidly than intramuscular, and the latter more rapidly than subcutaneous. The opinion was unanimous as to the size of the doses; i. e., not more than 200 cc. (50,000 units) altogether; for a child of 10, 80 cc. is given the first day, 60 cc. the second and 40 cc. the third.

Debré did not believe that the antitoxin had lost its merited reputation, but it failed to cure malignant cases because employed too late. The physician should not wait for laboratory reports before using the antitoxin. These reports either arrive too late or may be wrong, not showing the specific bacilli when the disease is already present or revealing the presence of short bacilli, so that valuable time is lost. The clinical examination should be the attending physician's guide. Local applications are useless. When a child who has been vaccinated against diphtheria shows evidences of the disease, the antitoxin should be administered the same as though no vaccination had been performed. There are a small number of children who cannot be immunized by vaccination.

Marfan and Debré did not think that antitoxin was of any avail in paralysis, but Lereboullet and Martin did not agree with this view.

BERLIN

(From Our Regular Correspondent)

Nov. 12, 1934.

The Congress of German Pediatricians

The German Society of Pediatrics held a congress in Brunswick to commemorate its fiftieth anniversary. The chairman, Professor Stolte of Breslau, brought attention in his speech to the progress made in pediatrics, in that it has been recognized as a specialty by the state. About the turn of the century in Germany 19 per cent of all children died during the first year of life, whereas in 1933 only 8 per cent died. In the large cities the difference was even more striking; in Breslau the rate of infant mortality decreased from 29 to 8 per cent within the same period.

Kleinschmidt of Cologne spoke on localization of bacteria in the intestine of new-born children. Spore-forming bacilli appear frequently in meconium and regularly in melena stools. Thanks to progress made in research on anaerobic cultures, it was found that in almost all children the anaerobes were found by the third day as precursors of Bacteroides bifidus. Next to already well known micro-organisms, the anaerobe Bacterium innutricus, which had not been described before, assumes the main rôle. It appears in the bacteriologic pictures in different forms. In the feces of the new-born the gas bacillus does not have the importance once attributed to it but in melena it is found frequently and in large numbers.

Investigations of the blood iodine of rachitic nurslings made by Fasold of Göttingen showed normal results. Therefore the thyroid gland cannot have a very considerable influence in the pathogenesis of this disease. The iodine content is not even slightly influenced by the addition of vitamin B. In fact, it diminished on the addition of vitamin A. In experimental scurvy of the guinea-pig, a lack of vitamin C was accompanied by a notable rise in the iodine content, followed by a marked retrogression.

Jochims of Kiel tested the biologic effect of isolated long ultraviolet rays on 160 rats, aged 6 weeks, under healthy living conditions and an unlimited amount of food containing salt and all the vitamins necessary to growth. When the cadmium lamp was used, the short ultraviolet rays—the antirachitic and the erythema producing rays—were held back below 315 microns. In direct irradiation of animals, the short waves had no influence. If irradiations are administered to the animals every two days for thirty minutes, they will be severely burned. If food and animals are mutually irradiated, the animals are soon exhausted. This effect is missing if a filter is not used; that is, if irradiation with polychromatic ultraviolet rays is administered. If the animals are given food with an optimal vitamin content and are irradiated for ten minutes with long ultraviolet rays, they regularly grow stronger than the control animals. This is not present if irradiation is administered with all the polychromatic ultraviolet rays. The sort of growth promoting substance is still a question: none of the well known vitamins come into consideration. According to this, an isolated long wave section of the ultraviolet rays produces biologic effects which may not be suspected in mixed ultraviolet rays.

In children presenting general convulsions due to spasmophilia, Stolte observed a strikingly high rest nitrogen value: 97, 63 and 48.3 mg. per hundred cubic centimeters, while two other children presenting manifest spasmophilia but no convulsions showed only 37.8 mg. per hundred cubic centimeters rest nitrogen. The convulsions, however, may not have conditioned the rise in rest nitrogen, for the highest value established after epileptic convulsions of long duration amounted to from 42.3 to 44.3 mg. per hundred cubic centimeters rest nitrogen. If these observations really hold true, a possibility of explaining these special manifestations of spasmophilia presents itself. Since in the past shifts in the mineral metabolism had to be taken into account in this disease, the increase in nitrogen containing bodies is of interest. Kleinschmidt of Lepzig dealt with investigations on creatine metabolism in health children and in children having muscular diseases. In children as contrasted with adults a creatinuria is said to be physiologically more in evidence. Kleinschmidt, however, clearly demonstrated that a healthy child whose diet contains no animal albumin does not excrete creatine. Kleinschmidt found creatine in the urine only in the case of muscular diseases. The highest amount of creatine was found in progressive muscular dystrophy of Erb. The creatine metabolism peculiarities of this disease are said to be of differential diagnostic importance; nevertheless Kleinschmidt was able to show that, at most, conclusions may be drawn from the amount of creatine spontaneously excreted —not, however, from the glycocoll or creatine tolerance nor from the excretion of creatine—which indicate whether the dystrophy of Erb or another muscular disease is present. Kleinschmidt was able to determine the characteristic rise in creatine excretion in Erb's dystrophy after glycocoll tolerance also in a large number of healthy children. The results obtained in adults with glycocoll in progressive muscular dystrophy of Erb were not corroborated by those in children.

K. H. Bauer of Breslau spoke on congenital surgical diseases and malformations in the light of heredity. The gene is no hypothetical concept but a highly effective chemical physical entity. Even if its real nature is still unknown, the knowledge of its effect is already widespread. Chondrodystrophy and osteogenesis imperfecta serve as examples of how universal the effects of genes may be. In chondrodystrophic dwarfism it is not only a question of an epiphyseal growth disturbance but also of disturbances of the ossification center of the subchondral cartilaginous growth and of joint forma-

tion. Each bone of the entire bone system had become specifically chondrodystrophic. The influence of internal secretions is contradicted by the cases of unilateral chondrodystrophy. The effects of a single gene are even more strikingly illustrated in a case of osteogenesis imperfecta. Here it is not only a question of a disease of the bone system with insufficient formation of the bony substance and predisposition to fractures, as is observed in severe cases by the involvement of other derivatives of mesenchymal tissue. Frequently effects traced to genes may be demonstrated in hereditary malformations, apparently circumscribed locally. A white forelock is, for example, frequently only a symptom of human spottedness, having short hands is only a stigma resulting from having short bones; in hereditary patellar luxation, numerous other joint disturbances are found. The so-called hereditary clavicular defect especially demonstrates that such a local malformation is often only a symptom of universal constitutional anomalies. The fundamental importance of such clinical evidence pertaining to a striking genetic effect lies in the fact that its demonstration always permits binding conclusions to be drawn about corresponding normal genes.

Ibrahim of Jena discussed the importance of the diseased anlage in diseases of the nervous system of children. Alcohol, x-rays and radium rays are considered the primary damaging agents. Little definite information is available on the importance of chemical contraceptives. Whether syphilis in the form of parasyphilitic trauma can produce any nuclear damage must be determined by further observation. Fetal trauma in the form of roentgen fetal microcephalia with ocular malformations has become well known. Indirect fetal damages due to rays seem to occur on distant organs of the pregnant woman. Anomalies of the amniotic membranes and of the secretion of amniotic fluid may be called changes in nidation. In the relation of heredity to feeblemindedness it is not easy to differentiate between endogenous and exogenous forms on the basis of clinical investigation. Recessive hereditary influences may be recognized in mongolian idiocy, but heredity alone does not explain all the known causal influences whereas the nidation theory is in harmony with all known influences. Hereditary influences are assumed in poliomyelitis; here structure analyses are made of biologic heredity. Hereditary influences have been found in chorea minor and in spasmophilic convulsions of infancy. Neuropathic disturbances may be produced by unfavorable environmental influences but hereditary influences are basic.

Kreuz of Berlin spoke on the special classification of typical deformities in the field of racial hygiene. There is no anatomic difference between hereditary clubfoot and that acquired within the uterus. Just as in congenital luxation of the hip, in clubfoot appropriate early treatment is extremely important because the ability of the child organism to restore the bone to complete usage diminishes with increasing age. The incidence of cure from the functional and anatomic point of view is high in cases treated early enough.

Orel of Vienna tested the influence of blood relationship of parents on children. He studied 686 children born in 305 Viennese marriages occurring during the years 1901, 1902, 1913 and contracted between persons related to the third or fourth degree. Although the material may be regarded as a consecutive series, it is selected; only the "Aryan" population was examined. The few unfavorable results found may be explained by the coincidence of recessive, morbid hereditary anlagen. That detrimental results were produced by inbreeding could be proved no more than the theoretically correct belief that higher types may be cultivated through the joining of valuable recessive hereditary anlagen.

W. Lehmann of Berlin-Dahlem presented a detailed report on examinations for heredity in rachitic twins. Heretofore there has been only one statistical report in this subject. Examinations of rachitic changes were made on ninety-five pairs of twins (forty monozygotic—thus hereditarily identical, and fifty-five dissimilar pairs, of which thirty-seven belonged to the same sex and eighteen to both sexes). All were children from 3 to 6 years of age. The results are given in the table.

Heredity in Rachitic Twins

	Rachitic Behavior	
	Same	Different
In 40 identical pairs.....	34 times=85 per cent	6 times=15 per cent
In 55 dissimilar pairs.....	15 times=27.3 per cent	40 times=72.7 per cent

The results show that identical twins suffer more frequently in the same way from rickets than dissimilar twins. Since this difference may not be explained by environmental conditions, it should be accepted from these examinations that the hereditary anlage plays an important part in the etiology of rickets.

MADRID

(From Our Regular Correspondent)

Nov. 25, 1934.

A Temporary Hospital Dictator

The revolution in Catalonia last October was organized and carried out by the local authorities of the Catalonian provinces, who spent the money appropriated for the public health of the provinces in preparing for the revolution, leaving the hospitals to be supported by charity. When the revolution broke out, the socialistic miners took Oviedo, the capital of Asturias, where they established their headquarters. The general hospital of Oviedo, the foremost hospital in Asturias, was placed in charge of the nurse Elias, a fanatic socialistic leader and also a tippler, who ordered the physicians of the hospital under arrest. Elias wanted the nuns to dress in modern nursing gowns if they were to continue nursing patients but the nuns would not change their clothing, so he improvised a group of nurses with girls from the red light district. The water supply and electric light had been shut off, the windows were closed by mattresses, and asepsis and sterilization in operating rooms were impossible. Operations were performed under these conditions on 250 seriously wounded men and, of course, a high rate of mortality resulted. This fact angered Elias, who summoned the physicians and told them: "The fact that gangrene has taken so many victims in the ranks of the socialists and not in the ranks of the soldiers of the government proves that you are against the revolution; if today and tomorrow none of the wounded soldiers of the government die from gangrene I will have you shot." But the dictatorship lasted no longer and some hours later the republic triumphed. Elias died in the last battle. The socialists set fire to fifty buildings and blew up the institute and the University of Oviedo. In the city of Mieres the physicians, who were forced to work constantly from the fifth to the nineteenth of October, were treated as prisoners. Prescriptions could not be filled unless they were approved by a member of the revolutionary committee. The sale of food was supervised by the revolutionary committee, who gave a daily allowance to physicians and their families amounting to one peseta (about ten cents) for every person in the family. The physicians were in misery and their homes were either plundered or burned. The revolution was not justified by poverty, for the socialist miners earn the best wages for workers in Spain. They acted under poor advice.

Difficulties in Spanish Universities

In some universities of Spain, students have formed into groups under the name of universitary federations. The groups

consist of students of conflicting opinions, those supporting the government and those supporting the revolution. These groups have caused disturbances in the universities. Recently in the University of Madrid one of these controversies resulted in a fight during which four students were wounded, three of them gravely. In the University of Barcelona, Catalan was accepted as the official language. This caused discontent among many Spanish speaking students from South America, who decided to leave the university. When the Italians learned of this discontent, they invited the South Americans to Italy, offering them reductions in the fare of railroads and street cars. More than 200 students went from Barcelona to Genoa.

Ramón y Cajal

Dr. Santiago Ramón y Cajal, the famous Spanish histologist and anatomist, who died recently, was the author, among other works, of the Manual de histología y de técnica micrográfica, Manual de anatomía patológica general, Histología, Textura del sistema nervioso del hombre y de los vertebrados (three volumes) and Trabajos de laboratorio (twenty-eight volumes). Cajal was a professor of anatomy in the Universities of Barcelona, Zaragoza, Valencia and Madrid and later was head of the Institute Cajal, where scientists from all over the world came to learn his methods. When a statue of Cajal was unveiled in Zaragoza, he declined the invitation to attend the ceremonies on account of poor health but really on account of his modesty. Shortly after the Spanish-American War he was received in the United States with great cordiality. He left 25,000 pesetas (about $2,500) to help educate selected students. The medical society Colegio de Medicos of Madrid is organizing the establishment of a school in the city of Petella de Aragon, which will be named after Cajal. His burial was a national manifestation of honor to him and of sorrow caused by his death.

ROME

(From Our Regular Correspondent)

Nov. 15, 1934.

Congress of Medical Radiology

The eleventh National Congress of Medical Radiology was recently held at Perugia, with Dr. Eugenio Milani as president and an attendance of about 400 radiologists and a large number of physicians. The first speaker was Dr. Lapenna of Belluno, who discussed roentgenology of the intervertebral disk, dislocation of the disk, and also Schmorl cartilaginous nodules. He classified vertebral diseases into two large groups according to their cause, either extrinsic or intrinsic. The first group includes spondylitis and spondylo-arthritis, which attack the cartilages and the disk, the vertebral body or the ligaments. The second group includes spondylosis and spondylo-arthrosis. The so-called Kümmell's spondylitis cannot be considered as a nosologic entity but rather as the terminal stage of an undiagnosed and latent fracture.

Dr. Palmieri of Bologna spoke on radiotherapy of the encephalon. He enumerated the neuropathologic conditions in which roentgen therapy is indicated and discussed the therapeutic action of roentgen irradiations, especially regulation of the interchange of cerebrospinal fluid under irradiations in internal hydrocephalus. In this connection the author refuted Marburg and Igalitzer's interpretations. He stated that roentgen treatment in encephalic tumors sometimes fails by itself to destroy the tumor, but it is of value if associated with surgery. Surgery is the treatment of choice in the syndromes of intracranial hypertension and it is also advisable to resort to it in acromegalic syndromes. The collaboration between roentgenologists, neuropathologists and neurosurgeons is essential for the interest of the patient and also with the aim of clarifying many problems, even those of a theoretical nature.

Dr. del Buono of Bari spoke on roentgen therapy of the spinal cord and the peripheral nerves. Roentgen therapy is indicated in nonsuppurative acute neuraxitis of the spinal cord, in neuralgia of a certain inflammatory origin in syringomyelic gliosis, and in medullary and juxtamedullary tumors. The speaker pointed out the satisfactory results of roentgen treatment in acute anterior poliomyelitis in children, in chronic and acute poliomyelitis in adults and in other forms of poliomyelitis. It is now admitted that the direct action of the rays on the inflammatory cells, which constitute the infiltration, is explained by a double effect of the rays, causing destruction of labile cells and checking the proliferation of histiocytes of the connective tissue. In the treatment of syringomyelic gliosis, the pathogenesis of which is now related to spongioblastosis, the action of the roentgen rays seems to depend on the particular radiosensitivity of the residual immature spongioblasts in the spinal cord. After roentgen irradiations of medullary and justamedullary tumors, the beneficial action of the rays can manifest itself by the modifications of the cerebrospinal fluid, such as disappearance of inflammatory pleocytosis and of xanthochromia and destruction of neoplastic cells, which are sometimes present in the cerebrospinal fluid. The satisfactory results of roentgen therapy in neoplastic inflammatory diseases of the spinal cord and of the peripheral nerves have been emphasized during the last few years because of the large number of cases observed.

Dr. Guarini of Naples spoke on roentgen treatment of the sympatheticus. He stated that the roentgen irradiations have both an important action on the sympathetic nervous system and definite indications in certain diseases. Michelazzi's studies on the rich innervation of veins, showing ganglions in the adventitia of the pulmonary vessels, led one to suppose that the action depends on the effects of the irradiations on the ends of the sympathetic and other nerves.

Dr. Benassi of Parma spoke on new methods of visualization of various cavities and organs after the administration of contrast mediums. He focused his discussion on the importance of hepatolienography by colloidal thorium dioxide as a contrast medium, and on the new methods of radiologic visualization of arteries and on the method of impregnation of the mucosae with contrast mediums. Lymphography, periencephalography, amniography and placentography may yet be considered in the experimental stage and probably will not have any clinical application of importance. Hepatolienography with colloidal thorium dioxide is harmless. Neither immediate nor late untoward results were observed by the speaker in more than a hundred cases followed for about three years. Hepatolienography is indicated when it is necessary to find out the volume, shape and position of the liver and the spleen. In the diagnosis of diseases of the digestive tract, the examination of the colon by the so-called impregnation of the mucosa by flocculation of colloids of thorium is of importance. The speaker closed by saying that colloids of thorium are better adapted than all the other opaque fluids for the visualization of organic cavities, either normal or in pathologic conditions.

Dr. Durante Is Dead

Dr. Francesco Durante, a senator and surgeon emeritus of the surgical clinic of Rome, died recently. He was the first surgeon to perform, in Italy, the suture of arteries and to undertake operations on the nervous system, especially on tumors of the frontal lobes. He originated a classic technic for craniotomy, which was the basis for several modified technics. He established the theory of the embryonic origin of tumors and published a description of it one year before Cohnheim. He was the founder of the large school of Italian surgery, having directed the surgical clinic of Rome for forty-five years. It is at this clinic that all the professors of Italian universities have studied.

Marriages

EDDIE HOUSTON THOMASON, Olanta, S. C., to Miss Kate Goodwin Odiorne of Manning, Dec. 20, 1934.

EMIL S. GOODYEAR, Kingston, N. Y., to Miss Mary Clare Archibald of Nashville, Tenn., Dec. 21, 1934.

FRANK DANA WEEKS, Ashland, Wis., to Miss Frances Mary Clark in Stockdale, Nov. 30, 1934.

MALCOLM E. MILLER, Ashland, Ohio, to Miss Marian Homewood of Sullivan, Dec. 25, 1934.

JAMES SLOAN ALTMAN, Pittsfield, Ill., to Miss Florence Mildred Cleven, June 5, 1934.

HUGH VICTOR DU BOIS to Mrs. F. M. Latham, both of Athens, Tenn., Dec. 4, 1934.

PAUL PADGET, Baltimore, to Miss Dorcas Hager of Vergennes, Vt., Nov. 30, 1934.

FRANK A. DONALDSON, Long Island, N. Y., to Miss Agnes Hunt, in November 1934.

ELLIS E. BAKER to Miss Opal Mankin, both of Gillette, Wyo., Dec. 25, 1934.

GEORGE CRILE JR. to Miss Jane Halle, both of Cleveland, Dec. 5, 1934.

Deaths

E. Rodney Fiske, New York; New York Homeopathic Medical College and Hospital, 1895; associate professor of medicine at his alma mater; fellow of the American College of Physicians; associate attending physician to the Flower Hospital; consultant to the Yonkers (N. Y.) General Hospital, Brooklyn, Nursery and Infants Hospital and the Huntington (N. Y.) Hospital and chief of the department of medicine, Carson C. Peck Memorial Hospital, Brooklyn; aged 61; died, Dec. 19, 1934, of Hodgkin's disease.

William Kuykendall ✠ Eugene, Ore.; Medical College of the Pacific, San Francisco, 1878; Member of the House of Delegates of the American Medical Association, 1926-1931; past president and formerly councilor of the fourth district of the Oregon State Medical Society; formerly member of the state legislature; fellow of the American College of Surgeons; on the staff of the Eugene Hospital; aged 79; died, Dec. 7, 1934.

Curtis Herman Jennings ✠ Fitchburg, Mass.; Baltimore University School of Medicine, 1902; member of the American Roentgen Ray Society, the New England Roentgen Ray Society and the Radiological Society of North America; veteran of the Spanish American and World wars; on the staffs of the Burbank Hospital, Fitchburg, and the Elliott Community Hospital, Keene, N. H.; aged 58; died, Dec. 31, 1934.

Frank Alexander Hughes ✠ Lieut. Commander, U. S. Navy, retired, Lexington, Ky.; Medical College of Virginia, Richmond, 1906; served during the World War; entered the navy in 1921 and retired in 1932 for incapacity resulting from an incident of service; part time otorhinolaryngologist to the University Health Service, University of Kentucky; aged 51; died, Dec. 23, 1934, of cerebral hemorrhage.

Herbert Spencer Abel, Providence, R. I.; Cornell University Medical College, New York, 1929; member of the Rhode Island Medical Society; on the staffs of the Beth Israel Hospital, Boston, the Charles V. Chapin Hospital, Rhode Island Hospital and the Miriam Hospital, Providence; aged 31; died, Dec. 3, 1934, in the Memorial Hospital, Pawtucket, of acute rheumatic fever and acute endocarditis.

Peter Alfred Bendixen ✠ Davenport, Iowa; Rush Medical College, Chicago, 1905; member of the Western Surgical Association; fellow of the American College of Surgeons; past president of the Scott County Medical Society; surgeon to St. Luke's Hospital and the Mercy Hospital; aged 52; died, Dec. 30, 1934, at a hunting lodge near Beardstown, Ill., of coronary thrombosis.

Daniel Edward Sevier, Asheville, N. C.; Jefferson Medical College of Philadelphia, 1895; member of the Medical Society of the State of North Carolina; past president of the Buncombe County Medical Society; for many years health officer of Asheville; formerly county health officer and county coroner; aged 66; died, Dec. 4, 1934, of coronary occlusion.

Lowell Lorrimer Youngquist, Marquette, Mich.; University of Michigan Medical School, Ann Arbor, 1916; member of the Michigan State Medical Society; served during the World War; physician to the Hospital of State House of Correction and Branch Prison; formerly city health officer; aged 46; died recently, of cerebral hemorrhage.

Cleaves Bennett ✠ Champaign, Ill.; College of Physicians and Surgeons of Chicago, 1896; past president and secretary of the Champaign County Medical Society; formerly councilor of the eighth district of the Illinois State Medical Society; aged 64; on the staff of the Burnham City Hospital, where he died, Dec. 22, 1934, of coronary thrombosis.

James Anthony Halpin ✠ Medical Inspector, Commander, M. C., U. S. Navy, Chelsea, Mass.; Georgetown University School of Medicine, Washington, D. C., 1912; entered the navy in 1917; served during the World War; aged 44; chief of the medical service at the U. S. Naval Hospital, where he died, Dec. 11, 1934, of chronic nephritis.

Clarence Walter Halliday, Detroit; Harvard University Medical School, Boston, 1920; fellow of the American College of Surgeons; surgeon to the Evangelical Deaconess Hospital; junior pathologist to the Harper Hospital; on the staff of the Cottage Hospital, Grosse Pointe, Mich.; aged 41; died, Dec. 17, 1934, of chronic myocarditis.

Francis Huber ✠ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1877; professor of clinical medicine at his alma mater; consulting physician to the Gouverneur Hospital and consultant in pediatrics, Jewish and Beth Moses hospitals; aged 80; died, Dec. 26, 1934, of heart disease.

Leland Howard Poore, Crescent Lake, Me.; Medical School of Maine, Portland, 1893; member of the Maine Medical Association; formerly member of the state legislature; aged 67; died, Nov. 29, 1934, in the Central Maine General Hospital, Lewiston, of uremia, diabetes mellitus and arteriosclerosis.

Samuel William Weinberg, Louisville, Ky.; Hospital College of Medicine, Louisville, 1904; clinical instructor in otology, rhinology and laryngology, University of Louisville School of Medicine; on the staff of the Jewish Hospital; aged 56; died, Nov. 21, 1934, of heart disease.

Thomas N. Millikin, Wilmington, Del.; University of Pennsylvania School of Medicine, Philadelphia, 1893; member of the Medical Society of Delaware; also a druggist; on the staff of the Wilmington General Hospital; aged 72; died, Nov. 24, 1934, of heart disease.

Albert E. Frey, Newark, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1888; aged 70; died, Dec. 27, 1934, in the Elizabeth (N. J.) General Hospital, of pneumonia following injuries received in an automobile accident.

Samuel Ewer Simmons, Berkeley, Calif.; Harvard University Medical School, Boston, 1899; member of the California Medical Association; served during the World War; aged 60; died, Nov. 21, 1934, in the Alta Bates Hospital, of carcinoma of the lung.

August C. Borchardt, New London, Wis.; Milwaukee Medical College, 1905; served during the World War; for seventeen years local health officer; aged 62; medical superintendent of the Memorial Hospital, where he died, Dec. 16, 1934, of angina pectoris.

David Robinsohn ✠ New York; Medizinische Fakultät der Albertus-Universität, Königsberg, Prussia, 1887; chief consultant emeritus to the Beth Israel Hospital; consultant to the Montefiore Hospital; aged 71; died, Dec. 6, 1934, of coronary thrombosis.

Max B. Gomberg, Providence, R. I.; University of Pennsylvania School of Medicine, Philadelphia, 1895; on the staff of the Miriam Hospital; aged 60; died, Dec. 12, 1934, in the Rhode Island Hospital, of coronary occlusion and lobar pneumonia.

William Joseph Herrick, Ottumwa, Iowa; Keokuk Medical College, 1895; member of the Iowa State Medical Society; past president of the Wapello County Medical Society; aged 67; on the staff of St. Joseph's Hospital, where he died, Dec. 12, 1934.

Antone Byron Jensen ✠ Menasha, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; on the staff of the Theda Clark Hospital, Neenah; aged 55; died, Dec. 14, 1934, of heart disease.

Eugene Moore Fowler ✠ Dallas, Texas; Southern Medical College, Atlanta, 1885; fellow of the American College of Surgeons; on the staffs of the Methodist Hospital and Emergency Hospital; aged 70; died, Dec. 27, 1934, of coronary occlusion.

Charles Austin Lester, Peoria, Ill.; Hospital College of Medicine, Louisville, Ky., 1897; served during the World War; aged 60; died, Dec. 9, 1934, in the Veterans' Administration Facility, Hines, of arteriosclerosis and valvular heart disease.

Louis David Henn, North Plainfield, N. J.; New York University Medical College, 1898; member of the Medical Society of New Jersey; aged 59; died, Dec. 12, 1934, in the Muhlenberg Hospital, Plainfield, of chronic endocarditis.

Orson Rueze Crooks, Kansas City, Mo.; Kansas City Medical College, 1897; member of the Associated Anesthetists of the United States and Canada; aged 64; died, Dec. 13, 1934, of coronary thrombosis and arteriosclerosis.

Harriett Belle Jennings Wagner, Victorville, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; aged 67; died, Nov. 25, 1934, in Etiwanda, of skull fracture.

Elisha Whitten Tinsley, Montgomery City, Mo.; Hospital College of Medicine, Louisville, 1889; member of the Missouri State Medical Association; aged 68; died Nov. 28, 1934, in Mexico, of carcinoma of the pancreas.

Philo Everett Jones ⊕ Portland, Ore.; Medical College of Ohio, Cincinnati, 1870; past president of the Utah State Medical Association; aged 86; died, Nov. 22, 1934, of prostatic obstruction and purulent bronchitis.

Thomas Hugh Tuten, Almeda, S. C.; Medical College of the State of South Carolina, Charleston, 1900; bank president; aged 59; died, Nov. 21, 1934, in the Riverside Hospital, Charleston, of cirrhosis of the liver.

Fred Russell Dame, Athol, Mass.; Baltimore Medical College, 1897; member of the Massachusetts Medical Society; aged 62; died, Dec. 21, 1934, in Orange, of skull fracture received in an automobile accident.

Frank Roy Loope, Seattle; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; aged 60; died, Nov. 7, 1934, of coronary thrombosis and arthritis deformans.

Owen Alonzo Smith, Farmington, Mo.; Washington University School of Medicine, St. Louis, 1892; member of the Missouri State Medical Association; aged 66; died, Dec. 2, 1934, of carcinoma of the stomach.

Lemuel Temple Waters, Savannah, Ga.; University of Georgia Medical Department, Augusta, 1914; member of the Medical Association of Georgia; aged 45; died, Nov. 27, 1934, of coronary thrombosis.

John B. Walkinshaw, Wellsburg, W. Va.; Western Reserve University Medical Department, Cleveland, 1883; formerly county coroner; aged 74; died, Nov. 14, 1934, of chronic myocarditis.

Percy Eugene Hofmann, Fargo, N. D.; Barnes Medical College, St. Louis, 1906; member of the North Dakota State Medical Association; aged 56; died suddenly, Dec. 18, 1934, of heart disease.

John S. Allen, Keithsburg, Ill.; Hahnemann Medical College and Hospital, Chicago, 1877; for many years bank president and president of the board of education; aged 83; died, Dec. 15, 1934.

Nathaniel Hibbard, Danielson, Conn.; Harvard University Medical School, Boston, 1882; member of the Connecticut State Medical Society; aged 79; died, Nov. 28, 1934, of chronic myocarditis.

Ulysses Samuel Wharton ⊕ Altoona, Pa.; Howard University College of Medicine, Washington, D. C., 1913; on the staff of the Altoona Hospital; aged 49; died, Dec. 2, 1934, of heart disease.

Joseph Grant Yocum, Middletown, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1901; served during the World War; aged 57; died, Dec. 19, 1934, of pneumonia.

Michael Thomas Naughton, Chicago; College of Physicians and Surgeons of Chicago, 1894; aged 67; died, Dec. 12, 1934, in the Veterans' Administration Facility, Hines, Ill., of nephritis.

Jacob A. Poppen, Otsego, Mich.; Northwestern University Medical School, Chicago, 1921; aged 42; died, Dec. 17, 1934, in the Bronson Methodist Hospital, Kalamazoo, of diabetes mellitus.

John Charles Whitacre, Memphis, Tenn.; State University of Iowa College of Medicine, Iowa City, 1897; aged 64; died, Nov. 15, 1934, of a malignant tumor of the gastro-intestinal tract.

Herbert Drew Snyder, Little Rock, Ark.; Atlanta Medical College, 1916; served during the World War; on the staff of the State Hospital; aged 41; died, Dec. 9, 1934, of heart disease.

J. Louis C. Perrilliat, New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1899; aged 59; died, in December 1934, of bronchopneumonia and septicemia.

Walter Pleasant Wilson, Madison, N. C.; North Carolina Medical College, Charlotte, 1908; aged 56; died, Dec. 12, 1934, in St. Leo's Hospital, Greensboro, of bronchopneumonia.

John Allen Whipple, Peoria, Ill.; National Medical College, Chicago, 1895; also a dentist and a lawyer; aged 79; died, Nov. 22, 1934, in the Proctor Hospital of acute nephritis.

Alexander J. Schweichler, Milwaukee; Medizinische Fakultät der Friedrich-Wilhelms-Universität, Berlin, Prussia, 1872; aged 87; died, Dec. 4, 1934, of chronic nephritis.

George B. Peck, Woodville, R. I.; Medical Institution of Yale College, 1871; Civil War veteran; aged 91; died, Nov. 20, 1934, of myocarditis and arteriosclerosis.

Charles F. Hubbard, Chicago; Hering Medical College, Chicago, 1899; member of the Illinois State Medical Society; aged 60; died, January 1, of chronic myocarditis.

Harvey Brown Bashore, West Fairview, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1889; aged 70; died, Nov. 28, 1934, of coronary embolism.

William F. Whitten, Columbus, Ohio; Starling Medical College, Columbus, 1886; aged 72; died, Nov. 15, 1934, in Lake Worth, Fla., of carcinoma of the pylorus.

Fay Xavier Field, Wellsboro, Pa.; Medico-Chirurgical College of Philadelphia, 1916; served during the World War; aged 43; died, Nov. 29, 1934, of acute myocarditis.

Donald D. McDougall, Cincinnati; Hygeia Medical College, Cincinnati, 1895; aged 72; died, Dec. 11, 1934, in the Bethesda Hospital, of chronic myocarditis.

John Albert Copeland, Long Beach, Calif.; State University of Iowa College of Medicine, Iowa City, 1900; aged 59; died, Dec. 5, 1934, of cerebral hemorrhage.

John Harvey Adair, Wall, S. D.; Eclectic Medical Institute, Cincinnati, 1877; aged 82; died, Nov. 20, 1934, in Rapid City, of carcinoma of the hard palate.

Benjamin Feltenstein, Chicago; College of Physicians and Surgeons of Chicago, 1895; aged 66; died, January 2, of coronary thrombosis and myocarditis.

Thomas Benton Stutzman, Denver; Bennett College of Eclectic Medicine and Surgery, Chicago, 1879; aged 84; died, Nov. 20, 1934, of heart disease.

Frank Elmer Cameron, Eloise, Mich.; Michigan College of Medicine and Surgery, Detroit, 1898; aged 59; died, Dec. 10, 1934, of angina pectoris.

Joseph Marvin Ware, Jackson, Miss.; Memphis (Tenn.) Hospital Medical College, 1906; aged 55; died, Dec. 10, 1934, of cerebral hemorrhage.

Edward Craig Ledman, Chicago; Starling Medical College, Columbus, 1903; aged 60; died suddenly, Dec. 3, 1934, of coronary thrombosis.

Harry William Sullivan, Cincinnati; Medical College of Ohio, Cincinnati, 1901; aged 56; died suddenly, Dec. 3, 1934, of coronary occlusion.

Horace Eaton Potter, Clifton, Kan.; Homeopathic Medical College of Missouri, St. Louis, 1885; aged 75; died, Oct. 23, 1934, of senility.

William Fletcher Smith, Memphis, Tenn.; Baltimore University School of Medicine, 1904; aged 69; died, Nov. 20, 1934, of heart disease.

William Elliott, Wolseley, Sask., Canada; University of Toronto Faculty of Medicine, 1893; aged 71; died, Oct. 27, 1934, of heart disease.

Mosley Stuart Chandler, Columbus, Miss.; Atlanta (Ga.) Medical College, 1890; aged 67; died, Dec. 5, 1934, of amebic dysentery.

John T. Wingate, Platte, S. D.; Albany (N. Y.) Medical College, 1908; aged 53; died suddenly, Nov. 17, 1934, of heart disease.

John H. Brower, Espanola, Wash.; Medical College of Ohio, Cincinnati, 1877; aged 84; died, Nov. 30, 1934, of heart disease.

Howard M. Fenton, Cleveland; Cleveland Medical College, 1878; aged 86; died, Dec. 15, 1934, of pneumonia.

Bureau of Investigation

C. R. EMEDY GOES TO PRISON

A Swindler Exposed by The Journal Is Once More in the Toils

In this department of THE JOURNAL for May 7, 1932, there was published a detailed article on a swindler whose real name seems to be Clarence Richard Emedy (sometimes spelled Emidy), but who has gone under such aliases as Don Miller, T. Baker, Douglas Noble, R. D. Whitman, etc. It was brought out in this article that Emedy had posed as an employee of the American Medical Association and had been victimizing alumni of Johns Hopkins University School of Medicine and especially members of the Sigma Chi fraternity. The article further told that Emedy's favorite story used in swindling physicians was one that had won him the name of "Spare-Tire Artist." He would represent himself as a medical student —generally from Johns Hopkins or Northwestern—and claim membership in Sigma Chi chapters at various institutions. His favorite prey were individuals whom he described as "his father's Sigma Chi classmates," and he specialized in alumni between the classes of 1895 and 1905. He had memorized the names, addresses and occupations of the class of the intended victim, as well as two classes immediately before and after. His memory is incredibly good and he appears to have had little difficulty in collecting anywhere from $5 to $25 from at least two hundred Sigma Chis on the story that his spare tire had been stolen and that he was a little short of money. Emedy has been exposed repeatedly in *Sigma Chi Bulletin* and in the *Magazine of Sigma Chi.*

In 1927 he tried to swindle a Sigma Chi man at Wichita Falls, Texas, with the result that he was arrested, charged with forgery and sentenced to two years in prison. He got out after serving a year and a half. In December, 1930, he was arrested again in Tulsa, Okla., but unfortunately the individuals who had been swindled, because of the comparatively small sums involved, were unwilling to spend any additional money in having Emedy put behind the bars.

In the spring of 1931 Emedy was working his scheme in the east. In September of the same year he was arrested by the police authorities of Montreal, but while he was detained by the police of that city for a short time, he got out under habeas corpus proceedings. From Montreal he went to Pittsburgh, and in January, 1932, was arrested for passing bad checks and sentenced to two years in the Allegheny County workhouse.

As already stated the Bureau of Investigation published its article on Emedy in THE JOURNAL, May 7, 1932, some weeks after he had been sent to the Allegheny County workhouse. The article closed with this paragraph:

> "For a year or so, then, the public will not be swindled by this impostor. As the man's record indicates that he is inherently crooked, it is probable that as soon as he is released from the workhouse in Pennsylvania, he will resume his old trade."

The prophecy proved correct. Although he entered the Allegheny County workhouse on Jan. 20, 1932, and had been sentenced to two years imprisonment, he was released on parole at the end of ten months—in October, 1932. He had not been out more than a few weeks when Mr. H. C. Burgan, Business Manager of Johns Hopkins University, reported to the Director of the Bureau of Investigation of the American Medical Association that Emedy was up to his old tricks and was swindling the families of some of the Johns Hopkins students residing in and near New York City.

Emedy then went out to the Pacific Coast and started the scheme in Los Angeles, where he bilked some thirteen "old grads" of sums ranging from $5 to $25 by posing as a son-in-need of an old college classmate. He was arrested and various alumni from universities or colleges in Michigan, Massachusetts, Illinois, Pennsylvania and California living in Los Angeles had sufficient public spirit, in spite of the small sums out of which they had been swindled, to put themselves to some expense and considerable inconvenience to appear against this swindler. As a result, Emedy was convicted and sentenced to the state penitentiary. Dr. J. Morris Slemons of Los Angeles, who was written to and asked for details of the sentence, telegraphed as follows:

> "Emedy transferred to Folsom Penitentiary December 27 after conviction on six counts of petty theft with prior conviction. Three sentences run concurrently; three consecutively. Minimum period of imprisonment fifteen years; maximum life. Parole board fixes actual sentence toward end of first year."

It is sincerely to be hoped that the parole board, when it considers Emedy's case, will have before it all of the facts regarding this confirmed and inveterate swindler and will not allow any mawkish sentimentality to soften either their hearts or heads. Emedy is a past master not only at the art of swindling, but in working the sympathy racket. At the time he was sentenced to two years' imprisonment in Wichita Falls, Texas, Emedy seemed to be very penitent, studying the Bible, praying over his sins, and thereby securing the sympathy of a prominent local preacher who interceded in his behalf.

Here are two of the free photographs, taken at state expense, of C. R. Emedy, as he appeared in Montreal in 1931, and Pittsburgh in January, 1932.

The authorities in California are to be congratulated in having proceeded promptly and intelligently.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

DERMATITIS IN STEREOTYPERS

To the Editor:—Have you any information on occupational dermatitis, caused by using gum paper in preparing mats for casting plates for newspaper publication? A man has a case of this and I would like the latest information. GEORGE R. JOHNSON, M.D., Calgary, Alta.

ANSWER.—At least four methods are in use in connection with stereotyping work. Causes of dermatitis may be associated with all. Calcium chloride is sometimes employed to maintain proper moisture for the mat. Nearly always mats are lubricated with oils, which sometimes are thinned with naphtha. In older methods much paste was utilized in which white and yellow dextrin, flour, gum arabic and gum tragacanth were common ingredients. This paste was furnished a preservative which varied, but phenol and cyanides often were used. In the past at least some mats have been treated with acid to facilitate the ready separation of the mat from the type. Lime and alum each have found some use in stereotype work. For a long time skin diseases have been attributed to flong and mat making as the source. Later, when molten metals are brought into contact with these matrices, additional sources of skin disorder arise; these, however, are not contemplated in the query. It would be difficult to establish clearly that a skin disease solely was produced by any one single factor in mat production, such as gum paper. Possibly

this may be accomplished by the making of contact tests on the skin, using paper as as the test substance. In the absence of sensitization to some paper constituent and in the absence of complication due to the secondary entry of mycotic organisms, a pure chemical dermatitis may be expected to clear up in brief time with or without treatment, provided no additional exposure takes place.

AMENORRHEA

To the Editor:—I would appreciate advice on treating a case of amenorrhea. A white woman, aged 30, married, suffered for the first time in 1924 for three months. Menstruation returned without treatment and remained regular until 1929. The second period of amenorrhea occurred in 1929 and 1930 for eleven months, with an increase in body weight of about 40 pounds (18 Kg.). In January 1913 a lung infiltration of the left upper lobe was found, which was treated and has remained inactive since that time. At present there are no physical signs of activity, roentgen examination showing a clearing up of the process and there being absence of fever and cough. Gynecologic examination reveals no abnormality. The third period of amenorrhea, still in progress, started one year ago. During this last year the patient has lost 40 pounds. She suffers so severely under markedly changed psychic conditions that help is really urgent. I do not think that either losing in weight or the last year's amenorrhea has any connection with the lung condition, which does not show any evidence of activity, and I am more in favor of the opinion of a familial "constitutional" condition, especially if one considers that two or three sisters had too, at different times, amenorrhea as well as dysmenorrhea, with similar changes in body weight. To check on the lung condition I would like to do a sedimentation test. Is it possible that the sedimentation time would be influenced by such an endocrinologic condition? What could be done in regard to a hormone treatment of this case of amenorrhea? Please omit name.

M.D., Ohio.

ANSWER.—Of prime importance in the treatment of this case is assurance of the patient that the repeated periods of amenorrhea in no way indicate that her health is impaired or that they will necessarily lead to trouble. Women who have intervals of freedom from menstruation in the absence of pregnancy are just as healthy as more women who have a regular monthly flow of blood. Contrary to the general layman's opinion, the blood which women lose every month does not contain harmful substances which the body must dispose of. This blood is just as healthy as the blood in the rest of the body. Recently Aschner has revived the old idea that menstrual blood rids the body of humors or toxins, but few gynecologists agree with him. Menstruation is after all only one symptom in the series of cyclic changes that take place in women during their reproductive period. Despite the absence of the flow of blood, the other changes may occur. Even gestation is possible after a period of amenorrhea, because ovulation may and does occasionally take place without the occurrence of menstruation.

If this information fails to convince the patient that she is not ill because of the amenorrhea, it may be necessary to try to bring about uterine bleeding. If the patient is interested in having children it is essential to determine whether she ovulates during these periods of amenorrhea, because without ovulation there can be no pregnancy. There are a number of ways of doing this. Clinically there are two signs of ovulation; namely, intermenstrual pain, or mittelschmerz, and intermenstrual spotting, but both of these signs are rare. Recently Kurzrok, Kirkman and Creelman (*Am. J. Obst. & Gynec.* **28**:319 [Sept.] 1934) added what they consider to be another indication of ovulation: the sudden appearance of the follicle stimulating hormone in the urine of nonpregnant women. Knaus (*Zentralbl. f. Gynäk.* **53**:2193, 1929) maintains that in women, just as in rabbits, the uterus fails to respond to pituitary extract twenty-four hours after ovulation, and this failure to react Knaus attributes to the corpus luteum. There are other means of determining ovulation, such as the examination of the ovaries in situ, the microscopic examination of the ovaries and uterine endometrium, and the recovery of human ova from the fallopian tubes. If ovulation is present the outlook is more promising, but even without ovulation it is possible to bring about bleeding from the uterus. This may be accomplished by giving large doses of female sex hormone over a period of time and then stopping the administration abruptly. However, such endometrium is of the proliferative type only and therefore not capable of harboring a fertilized ovum. The addition of corpus luteum hormone after the administration of follicular hormone can bring about a change from the proliferative type of endometrium to the premenstrual type. However, in order to induce cyclic bleeding this treatment will have to be repeated almost indefinitely, because it is purely substitutive. Such treatment is expensive and rarely worth while.

There is no connection between the change in the patient's endocrine disturbance and the sedimentation test. The latter indicates chiefly inflammation and infection.

CHRONIC MAXILLARY SINUSITIS

To the Editor:—I have two patients past 50 years of age who have chronic purulent maxillary sinusitis of many years' standing. Both are greatly troubled with discharge, crusting, head pains, neuralgia, rheumatism and frequent colds. Both have had submucous resections of the septum, turbinotomies, and antrum punctures at different operations during the last fifteen years. Jackson and Coates in their recent book advise the radical operation of removing the antral mucosa entire. One of these patients consulted a well known rhinologist in Kansas City, who strongly condemned the operation, saying that the Caldwell-Luc procedure usually made matters worse. He thinks that only myxomatous epithelium replaces the columnar type, resulting in great crusting with bad odor and much greater discomfort. Jackson and Coates say the columnar epithelium is regenerated in dogs, but how about in man? What are the facts in this matter? What treatment for these patients do you advise, when they can not go to other climates? Is the radical operation ever advisable for chronic purulent maxillary sinusitis? Please omit name.

M.D., Missouri.

ANSWER.—In order to answer this question as adequately as possible, it must be assumed that the patients described have a chronic sinusitis limited solely to the antrum of Highmore. The presence of suppuration in the fronto-ethmoid group of cells with the antrum acting as a reservoir would make the whole situation much more complicated. Granting, however, that no such complication exists, it is plain that the procedures mentioned have not been sufficient to give the desired relief. It must be clearly understood that there is no one method or operative procedure that can be used after simple antrum puncture and lavage have failed to give the desired result. The operations to be considered will depend on the condition in each instance and on the experience of the operator. The character of the secretion is important. If it is thin, profuse and of foul odor, one may expect a tendency to be stubborn. Instillation of iodized poppy-seed oil with subsequent roentgenography will render valuable information as to the thickness of the sinus mucosa and the presence of polyps. It will also be necessary to make sure that there are no dental changes responsible for the chronicity.

Many surgeons feel that a large antrum window will clear up situations as described and would not care to do a more radical operation until such an antrum window had been made. There are others who feel that they can judge by the symptoms and the length of time that adequate, conservative measures have already been carried out when to proceed to a more radical operation without an intervening antrum window operation.

Be that as it may, it may be stated fairly positively that the Caldwell-Luc operation cannot be categorically condemned. Properly done and for the proper indications, it yields in the hands of many men a high percentage of cures or, at least, marked mitigation of symptoms.

The type of epithelium that is regenerated in man has been described by Gregor McGregor (Further Proof of the Regeneration of Mucous Membrane in the Human Antrum, *Arch. Otolaryng.* **14**:309 [Sept.] 1931). Apart from the question of the microscopic nature of the type of epithelium encountered after operations of this character, one cannot lose sight of the fact that the epithelium now present is diseased to the point at which spontaneous cure can no longer be expected, and experience definitely shows that the new epithelium reacts in a great deal more satisfactory manner.

VASOSPASTIC DISTURBANCE OF HANDS

To the Editor:—A patient complains of blueness and numbness of the hands, especially when arising in the morning. This, he says, has been going on for about a year and is worse in damp and cold weather. During the past hot weather he had practically no symptoms, but during the few days recently that have been cool his symptoms have returned. He states that this may last from thirty minutes to one hour after arising and his feet are only occasionally and slightly involved, occasionally becoming numb but not changing color. The patient is a white man, aged 51, of Jewish (but not Russian) faith. He is a jeweler. He stopped smoking about ten months ago. The Kahn reaction is negative; the urine is normal; the blood sugar is within normal limits; hemoglobin is 85 per cent (Tallqvist). Physical examination reveals nothing of pathologic importance. What diagnosis would you make? What treatment should be given? What is generally thought of the calcium and vitamin treatment as discussed by Bernheim and London (*Am. Heart J.* **7**: 588 [June] 1932) in Raynaud's disease? Would such treatment be of value here? Please omit name and address.

M.D., Missouri.

ANSWER.—This condition represents a vasospastic disturbance of the hands, apparently bilateral. The cyanosis is the result of abnormal constriction of the arterioles of the skin from cold, with subsequent stasis and dilatation of the capillaries and small venules. It is an exaggeration of what occurs in normal subjects with exposure to cold. The problem involved is whether this is a primary vasomotor disturbance or one secondary to some other disease. The fact that the patient is a man, aged 51,

militates against the diagnosis of primary vasomotor disturbance, or Raynaud's disease. It is more likely that the condition represents a secondary form. One would first suspect, in a man, thrombo-angiitis obliterans involving the hands. The race of the patient who is under consideration favors this diagnosis. Exact information should be obtained as to whether normal pulsations are present in the radial and ulnar arteries of both hands. If occlusion is present, the diagnosis of thrombo-angiitis obliterans is tenable. In a small percentage of cases the occlusion is in the more distal arteries of the hands, and normal pulsations may be present in the wrists. Differences in the surface temperature of the individual digits, and arteriograms, will aid in deciding this. Other secondary forms of vasomotor disorder observed in the male are found with arteriosclerosis of the digital arteries, cervical rib, and neuritis. The crucial point in distinguishing between a vasomotor disorder and occlusive disease of the arteries rests on the presence or absence of pulsation in the palpable arteries of the wrists, or of the feet. Raynaud's disease in the male (incidence about 10 per cent in the male) at this age usually is not serious and usually does not lead to trophic disorders such as ulcers. Moderate protection, and exposure of the hands or the body to decreasing temperatures, carried out systematically, frequently will produce tolerance to cold, with amelioration of the cyanosis. In the secondary vasospastic disorders, treatment concerns solely the primary lesion. In thrombo-angiitis obliterans the usual measures, such a contrast baths, postural exercises, avoidance of local infection and trauma, and cessation of smoking, are important. In arteriosclerotic disease without ulcer, special treatment is not indicated. Usual precautionary measures are instituted. In the progressive forms of Raynaud's disease or thrombo-angiitis obliterans involving the hands, cervicothoracic ganglionectomy is efficacious.

DI-NITROPHENOL AND NEURITIS

To the Editor:—I have under my care a woman who is suffering from peroneal and anterior tibial peripheral neuritis. During the winter of 1933-1934 she had been taking di-nitrophenol for about four months. Three weeks after stopping this drug she collapsed with a high fever, sweating and profound prostration. She had a numb feeling in both legs from the knees down, and she was unable to move her toes. Her attending physicians at the time have sent a report that they attributed this to di-nitrophenol poisoning. A neurologist who saw her at that time reported the presence of peroneal and anterior tibial peripheral neuritis. She was ill for two or three weeks, and then these symptoms cleared up, except the numb feeling in her legs and pain in the plantar and transverse arches, which still persists with no tendency to recover. At the present time she has no motor symptoms, and the sensory changes are still indefinite and unconvincing, but she feels that her legs both are numb. The questions I should like to ask are: Have you heard of any case of peripheral neuritis resulting from di-nitrophenol? Have you heard of any acute poisoning as long as three weeks after cessation of the drug? Can you refer me to any authority who would be in a position to consult with reference to di-nitrophenol? I would appreciate it very much if you could throw any light on this subject.

DOUGLAS ST. J. WIGLE, M.D., Windsor, Ont.

ANSWER.—All the present evidence indicates that di-nitrophenol is completely excreted from the body in about three days and that the metabolism returns to the normal level in the same length of time. This is true regardless of whether the drug has been given for a few weeks or for many months, since apparently there is no accumulation of it in the body. It is therefore highly improbable that the febrile attack suffered by the patient three weeks after stoppage of the di-nitrophenol was due to this drug.

Tainter, Stockton and Cutting reported in THE JOURNAL (Nov. 4, 1933, p. 1472) that six of their patients developed a disturbance of taste while taking di-nitrophenol. This was probably the manifestation of a peripheral neuritis. Several mild cases of peripheral neuritis of the extremities have been observed but not yet reported in the literature. Therefore there can be no doubt that the drug can produce this symptom in a small percentage of cases. It develops slowly, with paresthesias and delayed sensory conduction, and is characteristically limited to the sensory fibers. On withdrawal of the drug, improvement begins within a week or two and is complete within from one to two months. After the symptoms clear up, treatment can be resumed cautiously, without further untoward effects, if a lower dosage level is used. The cases of peripheral neuritis that have been observed have generally been in patients who have taken unusually large doses of the drug over prolonged periods of time.

In the present case the peripheral neuritis may have been due to the di-nitrophenol, although it is difficult to explain the delayed onset except by assuming the symptoms to have been so minor as not to have attracted attention while the drug was being taken. The present "indefinite and unconvincing" nature of the symptoms might also fit in with this suggestion.

INJECTION METHOD FOR HYDROCELE

To the Editor:—Will you kindly inform me of the recent method of treating hydrocele, published by Drs. N. J. Kilbourne and Charles J. Murray, in the July 1932 issue of *California and Western Medicine?* I should like to know what injection fluid is used, the frequency of injections and the relative merits of this form of ambulatory treatment as compared to operative treatment of hydrocele. Please omit name.

M.D., Massachusetts.

ANSWER.—The authors of the article mentioned sought to find a solution for the injection treatment of hydrocele which would avoid pain, which would make it unnecessary for the patient to stop work while under treatment, which would not be dangerously toxic and which would be bactericidal in order to avoid infection. Their studies of various solutions led to the use of quinine hydrochloride and urethane, as suggested by Pybus of England, in the same strength as used in varicose veins. The injections are made after the thorough draining of the hydrocele through a 17 gage needle. It is very important not to let the needle slip out of the sac before injection. The dosage varies from 2 to 4 cc., occasionally being 6 cc. From two to five injections are needed at intervals of one to three weeks. The use of this solution by the authors in about sixty cases has brought satisfactory long run results.

DIFFERENTIAL DIAGNOSIS OF SPLENOMEGALY

To the Editor:—Kindly review the treatment and diagnosis of the following case of splenomegalia: The patient is a boy, aged 16 months. The family and past history is negative except for an uneventful attack of measles at the age of 15 months. There are three brothers, aged 5, 4 and 3 years, all of whom have had careful physical examination and showed no evidence of splenomegalia. The patient is large and pale, with a rather prominent abdomen. There are no changes of the conjunctivae. The liver seems slightly large, but I am not sure of this. The spleen is quite firm and extends almost to the level of the umbilicus. Urinalysis is negative. Blood examination shows 5,360,000 red blood cells, 10,150 white blood cells, color index 0.43, and hemoglobin 46.4 per cent Sahli. There was rather marked stippling of some of the red cells. Small lymphocytes number 49 per cent, large lymphocytes 4 per cent, polymorphonuclears 46 per cent, eosinophils 1 per cent, basophils 0.

LESLIE E. MYATT, M.D., Bridgeton, N. J.

ANSWER.—In a case of this description one would first want to feel certain that the tumor is due to enlargement of the spleen. It is sometimes difficult to differentiate splenic from renal tumors in infants, and an intravenous urogram may be necessary. In the second place, a little more information concerning the case would be desirable. Are the serologic tests for syphilis negative? Is the fragility of the erythrocytes normal? Should the blood count be repeated in view of the fact that the hemoglobin is low in relationship to the erythrocyte count? Have the blood smears been studied morphologically for evidence of immaturity? Is the function of the liver normal as indicated by a test for retention of dye? If the tumor is due to enlargement of the spleen and all these tests are satisfactory, the diagnosis of so-called von Jaksch's disease would be considered, although almost all the cases classified as von Jaksch's disease can be said to be secondary to infection, rickets, syphilis, malnutrition or dietary deficiency. In the event that results of the foregoing tests are satisfactory and that the tumor is an enlarged spleen, the treatment should consist of a balanced diet containing all the vitamins and the administration of iron, cod liver oil and calcium. It is possible that the splenomegaly may disappear as the child grows older. If this does not occur, the advisability of splenectomy should be considered at the age of 3 or 4 years.

ERYTHRODERMA DESQUAMATIVA

To the Editor:—Will you kindly outline the right treatment for an infant, 11 months old, who is suffering from erythroderma desquamativa and has had this condition for the past five months with no relief. I am giving him "Sebee" ripe bananas and quartz. No relief is in sight as yet. Please do not print my name and address.

M.D., California.

ANSWER.—The etiology of erythroderma desquamativa is still obscure. Intestinal intoxication has been considered the chief etiologic factor, but avitaminosis, especially a deficiency in vitamin H, is given weight by Moro, quoted by L. W. Hill (*J. Pediat.* **4**:436 [April] 1934). Moro recommends cow's milk, liver, and carrot juice in the diet to supply the vitamin H deficiency. Hill feels that this symptom complex is favored in its development by a diet relatively high in fat and sugar and retarded by a diet low in fat and sugar and high in protein.

The use of vegetable soup, viosterol and autohemotherapy may be considered as further adjuncts to therapy. The use of oil applications and bland ointments locally is advised, together with the avoidance of water on the skin.

DIETL'S CRISIS AND PREGNANCY

To the Editor:—Mrs. R. C., aged 27, married five years, has a child, aged 3 years. The delivery was right occipitoposterior, and high forceps were used and episiotomy performed. One year after giving birth the patient had an appendectomy with freeing of many adhesions, which caused a malformation of the cecum. The patient still complained of old familiar pains in the lower quadrant on the right side even after the removal of the appendix. I recommended the patient to a well known gynecologist, who said that the gynecologic examination was entirely negative. The patient has had many urinalyses, all of which have been completely negative. The patient continued to complain of severe pain when on her feet. The sensation she had was one of a heavy weight bearing down and resting as low down as the pubic bone, and gradually radiating toward the inguinal region. There was no herniation. I then suggested cystoscopy. The cystoscopic examination showed no evidence of an inflamed bladder and no congestion of the ureters. A pyelogram showed the right kidney dropped as low as the brim of the pelvis, thereby causing a kink in the right ureter. The urologist immediately advised that a nephropexy be performed, but I advised that a kidney support be tried first. I also suggested that the patient get into a knee-chest position on retiring and on arising for fifteen minutes each day. The patient took my suggestion. She has succeeded in putting on weight. Her former spastic attacks (Dietl's crisis) are less and less frequent as well as severe, showing that the support has really helped her considerably. Also the patient has a normal blood pressure as well as a normal heart. Now that I have given the history of the case with, I believe, as many details as are necessary for a full understanding of the case, I will greatly appreciate your opinion on the following questions: 1. Do you advise nephropexy even though the patient feels greatly relieved with the kidney support? 2. Even if the support does alleviate the pain and may not entirely correct the condition, is there any danger of any ureteral and kidney involvement due to the descent? 3. Can this condition clear up entirely without an operative procedure? 4. Would pregnancy be advisable under such circumstances, considering that the patient is solely dependent on the kidney support for comfort, which I doubt she will be able to wear with a pregnant uterus distending the abdomen? 5. What other suggestion have you to help this patient along in lifting up the kidney, other than that I have already advised? 6. How does the prognosis appear to you? Please omit name. M.D., New York.

ANSWER.—1. Although nephropexy gives satisfactory results in the majority of carefully selected cases, it appears preferable to continue with the kidney support in this instance.

2. If the patient is comfortable the danger of complications is slight, perhaps no greater than one might expect after operative correction.

3. Spontaneous complete restitution will probably not occur but a clinical cure may result incident to increased body weight.

4. Pregnancy is not contraindicated, although the risk of pyelitis is greater than in a normal patient.

5. Rest in various postures that mechanically favor kidney and ureteral drainage may help. The urine should be examined frequently. Surgical intervention may later be the treatment of choice if the symptoms become aggravated.

6. A prognosis without examination and study of the patient would be unwarranted; even then, prolonged observation might be required.

NICTITATING SPASM

To the Editor:—What is the recent modern treatment of habit spasm of the facial muscle or nictitating spasm? A man, aged 24, under my care has had it for the last four years. The condition was alleviated for six months after the first year by the administration of some glandular product, but I cannot find out what kind. I presume that it was some thyroid or parathyroid preparation. The patient is 5 feet 8½ inches (173 cm.) in height, weighs 164 pounds (74 Kg.) and is heavy set. Physical and laboratory examinations are negative in all respects. The spinal fluid shows a colloidal gold curve of 122222210000. There is no increase of globulin. No cells are present. The Kahn reaction is one plus. Rechecked two months later, it was negative. All neurologic manifestations are normal. He does not complain of any pain whatever. He stops the twitching at times for ten minutes; this is the longest period. When he is nervous, the twitching becomes very severe. The treatment he gets at the present time consists of ultraviolet rays over his face and parathyroid extract one-half grain (0.03 Gm.) daily for the four months since he came under my care, but I have not noticed any improvement. The food is very much selected as to fat, protein, carbohydrates and vitamins, with all the hygienic precautions. He received high frequency therapy over his face without any success, so this was stopped. What could be the glandular extract he received after the first year, which alleviated his symptoms? Shall I continue the parathyroid preparations? He has not shown any harmful effect from it, or good effects. What form of physical therapy should be applied? Please omit name and address. M.D., West Virginia.

ANSWER.—There is no single cause for facial spasm, of which there are different varieties, and consequently no single method of treatment. No description of the spasm is given, but since the term "nictitating" is used one may perhaps assume that the spasm is of clonic form and belongs with the "tics." Various reflex causes of organic character occur, such as irritations of branches of the trigeminal nerve by such conditions as carious teeth, and of the auditory nerve; errors of refraction should also be considered, especially if the spasm is bilateral. Many facial tics, however, seem to be of psychogenic origin and are due to emotional conflicts in persons constitutionally predisposed to neurotic manifestations. There is nothing in the facts given in this case to suggest that the administration of any glandular extract is indicated; parathyroid tetany is not limited to the face. The best advice that can be given is that careful search be made for sources of irritation in the region of the face and head and that should this give negative results the patient be referred to a psychiatrist for a study of his emotional life.

TREATMENT OF SYPHILIS

To the Editor:—A young man contracted syphilis three years ago. Treatment with neoarsphenamine and a bismuth compound was instituted six weeks after the initial lesion and continued for eighteen months. Three negative Wassermann reactions were obtained following the treatment. The last course of neoarsphenamine, according to the patient, was cut short because of severe gastro-intestinal disturbances. A recent Wassermann reaction was four plus, and a small dose of neoarsphenamine, 0.3 Gm., gave a severe reaction. Kindly suggest treatment. Please omit name and address. M.D., Kansas.

ANSWER.—In the absence of sufficient data it is difficult to say whether this patient has received adequate treatment or not. Treatment was begun presumably in the early secondary, seropositive stage. The dosage, number of injections in a course, and intervals between treatments are not stated, nor are the dates given of the three negative Wassermann reactions. There is apparently a serologic relapse unless it can be shown that there is a fresh infection. In view of the patient's intolerance to neoarsphenamine, other methods of treatment will have to be used. It is suggested that the patient receive a short course of iodides by mouth, followed by mercurial inunctions for six weeks and then a cautious resumption of arsenical treatment, preferably bismuth arsphenamine sulphonate intramuscularly. At the end of this course a blood Wassermann and spinal fluid examination should be made and further treatment should be based on the outcome of these tests. The correspondent should be reminded that the percentage of cures in secondary syphilis is variable.

DIFFERENTIAL DIAGNOSIS OF DYSENTERY

To the Editor:—A woman, aged 65, has a morning diarrhea. She has from six to eight watery stools each morning without pain. In the afternoon she is better and is able to attend social functions without inconvenience. Obesity is a family characteristic. The patient has been very obese ever since earliest infancy. She is of a high-strung, nervous temperament and has been under great nervous strain for several years on account of financial reverses. A mixture of camphorated tincture of opium, aromatic sulphuric acid and ginger controls the diarrhea, but she must keep on taking it. Rest in bed controls the diarrhea, but when she gets up it recurs. Dieting does not control the diarrhea. It has continued for nearly a year. Any suggestion as to cause and treatment will be thankfully received. Please omit name. M.D., Ohio.

ANSWER.—It is impossible to give a diagnosis and the treatment for the case presented without more laboratory and roentgenologic data. In cases of this type one should be sure that the stool has been carefully examined for the cyst and the motile Endamoeba histolytica. In addition, the blood should be studied especially for its agglutination properties for the various members of the bacillary dysentery group. It might also be of interest to know the presence or absence of free hydrochloric acid. When these facts are presented, treatment will depend, of course, on the results of these observations.

CHAULMOOGRA OIL IN ARTHRITIS

To the Editor:—Please give me some information as to the rationale of the use of chaulmoogra oil in the treatment of arthritis, the type of arthritis in which it is used, the prognosis, the dose, the type of oil, the frequency of treatment and the amount that may be given. Please omit name and address. M.D., Texas.

ANSWER.—The use of chaulmoogra oil in arthritis is entirely empirical, based on the observation made by Paul A. McIlhenny (Chaulmoogra Oil in the Treatment of Arthritis, *New Orleans M. & S. J.* **84**:182 [Sept.] 1931) at the National Leprosarium in Carville, La., that secondary infectious arthritis is not encountered in leprosy patients treated with chaulmoogra oil. It has been employed in a limited number of the atrophic, hypertrophic and mixed types of arthritis with allegedly good results. Gaston A. Hebert (Treatment of Arthritis with Chaulmoogra Oil, *Tri-State M. J.* **5**:1050 [Feb.] 1933) has employed

it in chronic infectious arthritis of the atrophic type. Of the fifty-seven cases thus far reported, almost all showed some improvement during the second week of treatment, the average patient becoming symptom free in about eight weeks. To crude chaulmoogra oil is added 10 per cent of olive oil with 0.2 per cent of benzocaine; of this mixture, after an initial dose of 3 cc. a dose of 5 cc. is injected deep in the gluteal muscles twice a week. The treatment should be continued for some weeks after the patients have become symptom free.

FOOT AND MOUTH DISEASE—BACILLUS XEROSIS

To the Editor:—About ten months ago I had a patient, a white boy aged 15 years, who gradually became ill with what appeared to be an ordinary pharyngitis, lasting for three or four days without fever. About the fourth day he complained of more soreness in his throat, extending out into his mouth, gums and tongue. Examination at this time showed superficial ulcerations scattered over the pharynx and fauces. (The tonsils had been removed completely.) The entire mucous membrane of the cheeks, gums and underneath the tongue was covered with a gelatinous gray pseudomembrane. Cultures from the mouth, throat and nose were at first reported as positive for diphtheria, but further study showed the organisms almost a pure culture of Bacillus xerosis. Since he had already been ill five or six days at the time of the positive diphtheria report, he was given 40,000 units of diphtheria antitoxin, after which the membrane began to separate, leaving ulcerated areas where it had been. There followed a period of several days during which there was a profuse thin, colorless, irritating secretion from the mouth necessitating his turning his face to the side so that the secretion could run out on a towel. There had also been involvement of the eyes, nose and external urethral meatus. Recovery was gradual over a period of about ten days. This boy has now presented himself with a condition resembling the onset of the illness, and a similar membrane is just appearing on the inside of the cheeks. Cultures from the throat have been taken but not reported on as yet. A search of medical literature available to me fails to disclose such a clinical picture by Bacillus xerosis. I would appreciate any information you can give me about this condition, especially as regards treatment. Please omit name.

M.D., Alabama.

ANSWER.—There is much in the picture given that suggests foot and mouth disease, but no mention is made of the usually associated cutaneous lesions. The association with diseased cows or goats or the use of milk, butter or cheese from sources where foot and mouth disease is present might aid in the diagnosis. Naturally the action of irritating agents taken into the mouth must be considered. The xerosis bacillus is one of a considerable group of bacteria found on normal and diseased mucous membranes and usually spoken of as pseudodiphtheria bacilli or diphtheroids. They are not believed to be pathogenic. The treatment should be cleansing with mild, nonirritating washes. Ulcerations may have applications of silver nitrate.

HEMATOMA AND SLOUGH AFTER INJECTION OF VARICOSE VEIN

To the Editor:—A woman, aged about 55, was treated for varicose veins of the legs and thighs by injections with sclerosing solutions. At the site of one injection a small hematoma appeared to form outside the vein and for several weeks dark, thick blood escaped from the needle puncture wound, although a fine needle (No. 26) was used. After as much of the underlying thick blood as possible had been pressed out through this small opening, the bloody discharge stopped, but for about six weeks a tiny ulcer, 2 mm. in diameter, has persisted at the site of the puncture. This ulcer has a depth of about 0.5 cm. and its floor appears to be formed of blood clot. For about 3 cm. distal to the puncture there is moderate induration with little redness or tenderness along the course of the vein, which is now collapsed. This is the first time I have encountered this annoying complication of the injection treatment of varicose veins and I would appreciate any information you can give me as to the probability of spontaneous healing, and suggestions as to treatment. Thus far treatment has consisted of a daily dressing and, after cleansing, painting with 5 per cent solution of mercurochrome and strapping with adhesive strips. The Wassermann reaction is negative. Please omit name and address.

M.D., California.

ANSWER.—The lesion described is a typical slough following the injection of a sclerosing solution beside the vein or into the wall of the vein. From the description given it seems probable that the sclerosing solution, the nature of which is not mentioned, has been deposited into the wall of the vein, producing a necrosis of the wall and resulting in a communicating hematoma. The periphlebitis distal to the site of puncture will gradually subside, but the ulcerated area, together with its indurated margin, heals very slowly or not at all. By far the best method is to excise the entire area widely, followed by primary suture. A small strip of gutta percha may be inserted for draining the wound for twenty-four hours. The excision, however, must not be undertaken in the presence of secondary infection.

WHY WE CAN'T DRINK SEA WATER

To the Editor:—Why should a person die of thirst at sea, or why is it apparently impossible to maintain the fluid needs of the human organism by sea water? Please omit name.

M.D., Connecticut.

ANSWER.—The inorganic salt content of sea water is very much higher than that of the blood of man and other terrestrial animals. The salt content of the water of the Atlantic and Pacific oceans is over 3 per cent, while that of the blood plasma of man is about 1 per cent. Most of the salt in sea water is the ordinary sodium chloride as is the case with the human blood plasma, but in the salt water is proportionately more magnesium sulphate than in the human blood plasma. It is also known that excess salts in the blood are eliminated by the kidneys. This elimination requires the elimination of an increased amount of water, which, in the first instance, is taken from the blood plasma. In the case of a person, therefore, who tries to ease his thirst by drinking sea water, the following things happen:

Because of the higher salt content of the sea water there is an increase of concentration of inorganic salts of the blood. This tends to draw water from the tissues and increase the thirst sensation. At the same time the kidneys are eliminating these excess salts together with a great deal of water from the blood plasma. This further increases thirst. Lastly, the magnesium sulphate in the sea water is not readily absorbed from the intestine, and the presence of this salt in the intestine holds back a certain amount of the water from absorption. It is therefore clear that endeavoring to stop thirst by taking sea water aggravates the thirst and hastens death. People will therefore live longer and with less discomfort by taking no water at all than by drinking sea water. People can survive longer without water if they abstain from taking food.

CELLOPHANE POISONING

To the Editor:—Kindly send to me information, or refer me to literature, relative to cellophane poisoning. I have a patient working in a bakery, whose work consists of wrapping rolls in cellophane, which is then sealed by heat. The fumes of the heated cellophane appear to act as a toxic agent, inducing vertigo, nausea and abdominal pain.

ISADORE SANDOCK, M.D., South Bend, Ind.

ANSWER.—The constituents of cellophane are probably not always the same, as it is believed that variation may be introduced to meet special requirements. Somewhat speculatively it is noted that moisture-proof cellophane may be coated with a lacquer, wax or possibly tricresyl phosphate. Primarily, cellophane is cellulose. It is not known that the complete combustion of this material in small quantities would give rise to harmful amounts of any such agents as nitrous gases, acid vapors or carbon monoxide. In fact, it is well known that cellophane to the amount of many tons is burned daily, sometimes in open incinerators, without the development of any body of information that the heating or burning of this material introduces any practical dangers. Thousands of workers daily seal up cellophane wrappers, either by heat or by other fixatives, without the development of injurious effects attributable to the chemical properties of cellophane. Therefore it is doubted that the condition described in this query may be attributed to cellophane as a toxic agent. In many bakeries, irrespective of the presence of cellophane, workers suffer from nausea, vertigo, headaches and pallor. In part, such disturbances are due to excessive temperatures in some bakeries, high humidity, odors, carbon monoxide, dusts, undue fatigue, and physical responses to endless monotony. It is believed that this type of injury source should be considered in connection with the present situation rather than the direct attribution of the disorder to cellophane.

SHORTENING OF STUMP AFTER AMPUTATION

To the Editor:—A patient had his leg amputated about five years ago. Measurement taken a few days after operation is supposed to have shown that the stump measured 6½ inches below the knee. Examination at this time shows that the stump, including the pad, measures about 4⅞ inches. The stump of the tibia measures approximately 4½ inches. I should like to know first whether it is possible for this much atrophy to take place in a period of five years. Secondly, how much, if any, shortening of the bone of a stump will take place in that length of time? Please omit name.

M.D., Michigan.

ANSWER.—It is not probable that the difference in the measured length of the stump as stated can be explained on the basis of atrophy. Little if any shortening of the bone of the stump has been noticed even after the lapse of years. Measurements of stump length are not accurate unless made by the same surgeon each time and using the same landmarks.

ICEBOX OR ELECTRICAL REFRIGERATION

To the Editor:—There has been a great deal of discussion about the use of ice in domestic refrigeration as contrasted with electrical methods according to whether one talks to a member of an ice company or to a General Electric Company salesman. I have always used the "old fashioned" icebox with perfect satisfaction but am even chided by some of my colleagues. Beyond the mechanical conveniences of the electrical machine are there many valid hygienic advantages?

FRANK R. SMITH JR., Baltimore.

ANSWER.—Economy is claimed to be an advantage by both sides in the controversy. Advocates of ice claim that there is less drying out of foods than with electrical refrigeration.

When the refrigerant gas is poisonous, a health hazard may result from leaks in the mechanical refrigerator, as shown by the experience with methyl chloride in Chicago several years ago.

CHLOASMA

To the Editor:—Do you have any suggestions regarding the removal of darkly pigmented blotches about the neck and upper part of the chest of a healthy mother, aged 34? These occurred at the time of her second pregnancy two years ago and were called chloasma at the time. Other pigmentary changes include premature and complete graying—almost whitening—of the scalp hair and of one eyebrow and corresponding eyelashes. Please omit name.

M.D., Iowa.

ANSWER.—Clinical investigation and further advance in knowledge of the glands of internal secretion indicate that lesions such as those mentioned are usually ascribed to endocrine disturbances. No treatment is necessary. In fact, no satisfactory specific therapeutic hormone substance is as yet available.

Surgical removal of the pigmented blotches is not indicated unless for cosmetic reasons. In the event that removal of the pigmented areas is contemplated, the surgeon should avoid squeezing the lesions with tissue forceps at the time of excision (avoidance of traumatism is more important than wide excision in the prophylaxis against cancer).

TOXICITY OF LUPINES

To the Editor:—A patient of mine, an Italian, aged 48, recently presented himself to me complaining of abdominal swelling and a feeling of "tightness" in the stomach, with slight nausea and a history of having vomited once. On examination, extreme distention of the intestines was the only positive finding. There had been no bowel movement for thirty hours. The condition was one of intestinal obstruction without obvious cause, combined with a negative history for gastro-intestinal trouble. On close questioning about his recent diet, it developed that the day before he had eaten some lupines, a beanlike legume, which is a popular food with Italians and is eaten after the hard kernel has been left standing in water for a week or more. This patient had not consumed any of this food in many years. On questioning other Italians, I found that they all remarked on the "poisonous" properties of this legume on certain occasions. The patient finally passed much flatus after several high enemas had been given, but not until a surgical consultation had been held. The distention did not return, and he recovered quickly. I would greatly appreciate information on the pharmacology and toxicology of lupines and should like to know if in your opinion this paralytic ileus could have been due to a toxic effect of this legume or the water in which it was soaked.

GRANT GUILLEMONT, M.D., Niagara Falls, N. Y.

ANSWER.—It is well known that many lupines have toxic qualities. Alkaloids (lupinine, lupinidine, lupanine) have been isolated from them. These in general have a coniine-like action; i. e., they produce paralysis of the nerve endings of voluntary muscles. As they also have an action on the vegetative nervous system, there is a possibility that the results observed might have been due to insufficient soaking of this lupine or to the consumption of some of the water in which it was soaked.

ADDICTION TO COCAINE

To the Editor:—In your opinion could the use twice daily over a period of years of an oily solution containing 1 grain of cocaine to the ounce, applied within the nose, result in cocaine addiction? Please omit name.

M.D., Pennsylvania.

ANSWER.—It could and most probably would result in a habit. Cocaine administered daily to any 100 persons for a year would make many addicts, because few, less than 15 per cent, would be satisfied with the result obtained without increasing the amount used per dose or increasing the number of doses used daily. The cocaine habit is almost always a pleasure or vicious habit, without true withdrawal abstinence symptoms as found in morphinism. The patient can be deprived of cocaine immediately with no treatment and without any serious symptoms of collapse developing. However, cocaine, like diacetylmorphine, will produce a psychosis or change in the moral character more quickly than will morphine. If the cocaine in the solution is discontinued for a few weeks it will be possible to check how much or how little of a habit exists. Before the enactment of the Harrison Narcotic Law many cocaine addicts were made by the use of the so-called catarrhal cures (containing cocaine) advertised extensively to the public.

TREMORS AFTER THYROID ADMINISTRATION IN HYPOTHYROIDISM

To the Editor:—A patient with severe hypothyroidism was entirely relieved of his symptoms by a daily dose of 4 grains (0.026 Gm.) of thyroid, U. S. P., but a definite tremor developed that was especially annoying when writing. The tremor disappeared when the medication was discontinued. While I was determining the maintenance dose, which seems to be about 2 grains (0.13 Gm.) daily, the tremor returned, being apparent even with 1 grain (0.065 Gm.) daily. What therapeutic maneuver would you recommend that might permit adequate medication and still avoid the tremor? Please omit name.

M.D.

ANSWER.—A strong suspicion of the original diagnosis of hypothyroidism arises when small doses of thyroid produce toxic symptoms, such as tremor; a low metabolic rate occurs in some individuals because of fatigue, malnutrition or some other nonthyroid depressing mechanism. These patients while having a subnormal metabolic rate do not exhibit either external or internal signs of myxedema. In particular, the blood cholesterol is not elevated. Furthermore, they are not benefited by thyroid and fatigue and nervousness are often increased. It may be that the patient falls into this group. If, however, there is incontrovertible evidence that thyroid deficiency exists and thyroid is required, the tremor might be controlled by the use of tincture of stramonium on the assumption that some underlying neurologic cause of the tremor has been activated by the thyroid medication.

BURNS OF THE LARYNX

To the Editor:—Can you furnish me with any literature on external burns of the larynx, especially electrical burns? I have a patient who came in contact with a high tension wire, which struck him at the larynx, destroying the skin and tissues down to the laryngeal cartilages. These cartilages are now sloughing. I am wondering whether there is anything in the literature of a similar occurrence.

HOWARD L. MITCHELL, M.D., Lexington, Va.

ANSWER.—The literature on this subject is almost wholly lacking, and the only reference we have been able to find is the following:

Foerster, A.: Changes in Tracheal Mucosa in Victim of Fire, *Deutsche Ztschr. f. d. ges. gerichtl. Med.* **19**: 293, 1932.

FRACTURE OF PATELLA AFTER MUSCLE ACTION

To the Editor:—Kindly advise me concerning the rarity or frequency of fracture of the patella due to muscular action, as landing on one foot forcibly with semiflexed knee, or sudden muscular action, the knee semiflexed, to extricate the foot when tightly held by foreign control. Kindly omit name.

M.D., Ohio.

ANSWER.—Fracture of the patella itself is not a frequent occurrence as a result of sudden muscular action.

Rupture of the extensor apparatus is more common, especially above the patella.

MYCOTIC ABSCESS

To the Editor:—Several weeks ago (THE JOURNAL, Nov. 10, 1934, p. 1472) in replying to a query concerning the cause of a mycotic abscess following a dental operation you stated that the fungi must have been in the anesthetic solution and thus injected into the tissue. Of course this is one possibility, but I do not believe that the stock anesthetic solution is in much use today by dentists. The majority of them use ampules or boil up their solutions when needed.

I wish to call attention to a very probable cause for the mycotic abscess. It must be remembered that yeast cells and other types of fungi, especially of the nocardial group, are common mouth inhabitants. I have demonstrated actinomyces-like fungi deep in the tissues in cases of chronic and recurrent gingivitis. I have also been able to recover yeast cells from tissues covered by dentures, especially in cases of so-called rubber-sore mouths. Incidentally, I have also recovered this microorganism from inflamed areas covered by gold dentures. Whether these fungi are pathogenic or not has to be determined, but it is a fact that they are found in diseased areas much more frequently than in normal ones.

It is my belief that these mycotic abscesses are due to inoculation by the hypodermic needle carrying fungi, present in or on the mucous membrane, deeper into the tissues during the course of an injection.

LESTER RICHARD CAHN, D.D.S., New York.
Associate Professor of Oral Pathology, Columbia University School of Dental and Oral Surgery.

Medical Examinations and Licensure

COMING EXAMINATIONS

ALASKA: Juneau, March 5. Sec., Dr. W. W. Council, Juneau.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B candidates).* The examination will be held in various cities of the United States and Canada, March 23. *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. Group B application lists close Feb. 23 and Group A application lists close May 10. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. *Application must be filed at least sixty days prior to date of examination.* Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

CALIFORNIA: Los Angeles, Feb. 4-7. Sec., Dr. Charles B. Pinkham, 420 State Office Building, Sacramento.

CONNECTICUT: *Basic Science.* New Haven, Feb. 9. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven.

ILLINOIS: Chicago, Jan. 22-24. Superintendent of Registration, Department of Registration and Education, Mr. Eugene R. Schwartz, Springfield.

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* The examinations will be held in medical centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEVADA: *Reciprocity.* Feb. 4. Sec., Dr. Edward E. Hamer, Carson City.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 28-31. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, Room 315 Education Bldg., Albany.

PUERTO RICO: San Juan, March 5. Act. Sec., Dr. Ramón M. Suarez, Box 536, San Juan.

VERMONT: BURLINGTON, Feb. 13-15. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

WYOMING: Cheyenne, Feb. 4. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

New Mexico October Report

Dr. P. G. Cornish Jr., secretary, New Mexico Board of Medical Examiners, reports the written examination held in Santa Fe, Oct. 8-9, 1934. The examination covered 13 subjects and included 100 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Nine physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen, Bavaria, Germany		(1919)	88.5

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Arkansas School of Medicine		(1911)	Arkansas
College of Medical Evangelists		(1934)	N. B. M. Ex.
George Washington University School of Medicine		(1905)	Dist. Colum.
Northwestern University Medical School		(1928)	N. B. M. Ex., (1934) Kansas
Rush Medical College		(1931)	Florida
State University of Iowa College of Medicine		(1932)	Colorado
Tulane University of Louisiana School of Medicine		(1928)	Texas
Albany Medical College		(1930)	New York

Missouri Reciprocity and Endorsement Report

Dr. E. T. McGaugh, State Health Commissioner, reports 35 physicians licensed by reciprocity and 5 physicians licensed by endorsement from Jan. 15 to Sept. 12, 1934. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Emory University School of Medicine		(1925)	Georgia
Northwestern University Medical School		(1934)	Illinois
Rush Medical College		(1926)	Illinois, (1928) Michigan, (1930) Washington
University of Illinois College of Medicine		(1924), (1929)	Illinois
State University of Iowa College of Medicine		(1931)	Iowa
University of Kansas School of Medicine		(1930, 2), (1931, 2), (1932, 2), (1933, 6)	Kansas
University of Louisville School of Medicine		(1932)	Kentucky
Tulane University of Louisiana School of Medicine		(1931)	Mississippi
Johns Hopkins University School of Medicine		(1931)	Maryland
Detroit College of Medicine and Surgery		(1933)	Michigan
University of Minnesota Medical School		(1934)	Minnesota
St. Louis College of Physicians and Surgs., Missouri		(1891)	Iowa
University of Nebraska College of Medicine		(1931)	Nebraska
Jefferson Medical College of Philadelphia		(1932)	Ohio
University of Tennessee College of Medicine		(1932)	Alabama, Tennessee, 2
Baylor University College of Medicine		(1933)	Texas
University of Virginia Department of Medicine		(1932)	Virginia
University of Wisconsin Medical School		(1932, 2)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School		(1933)	N. B. M. Ex.
University of Kansas School of Medicine		(1932)	N. B. M. Ex.
Washington Univ. School of Medicine (1930), (1931),		(1932)	N. B. M. Ex.

Alaska September Report

Dr. W. W. Council, secretary, Alaska Board of Medical Examiners, reports the written and practical examination held in Juneau, Sept. 10, 1934. The examination covered 11 subjects and included 44 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. Three physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Oregon Medical School		(1933)	90
University of Virginia Department of Medicine		(1932)	94

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Minnesota Medical School		(1933)	Washington
Medical College of the State of South Carolina		(1924)	Washington
University of Virginia Department of Medicine		(1931)	Washington

Wyoming October Report

Dr. W. H. Hassed, secretary, Wyoming State Board of Medical Examiners, reports the written examination held in Cheyenne, Oct. 1, 1934. The examination covered 16 subjects. One candidate was examined and failed. Five physicians were licensed by reciprocity. The following schools were represented:

FAILED	Per Cent
Osteopath*	69

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1924)	Colorado
Chicago College of Medicine and Surgery		(1916)	Illinois
University of Michigan Medical School		(1933)	Michigan
University of Nebraska College of Medicine		(1926), (1933)	Nebraska

* Examined in osteopathy and surgery.

Book Notices

A Textbook of Histology: Functional Significance of Cells and Intercellular Substances. By E. V. Cowdry, Professor of Cytology in the School of Medicine, Washington University, St. Louis, Mo. Cloth. Price, $5.50. Pp. 503, with 242 illustrations. Philadelphia: Lea & Febiger, 1934.

Essentials of Histology, Descriptive and Practical for the Use of Students. By Sir E. Sharpey-Schafer, F.R.S. Thirteenth edition edited by H. M. Carleton, M.A., B.Sc., D.Phil., Lecturer on Histology in the University of Oxford. Cloth. Price, $5. Pp. 618, with 721 illustrations. Philadelphia: Lea & Febiger, 1934.

A Textbook of Histology. By Harvey Ernest Jordan, A.M., Ph.D., Professor of Histology and Embryology, University of Virginia. Sixth edition. Cloth. Price, $7.50. Pp. 738, with 610 illustrations. New York & London: D. Appleton-Century Company, Inc., 1934.

The seemingly lucrative field of histology textbook writing has made it possible to review a number of textbooks that have been put on the market either as new books or as new editions of older textbooks. Such a comparison is of interest because it shows what teachers of histology consider to be essential for medical students. With the rapid accumulation of practicable knowledge in all fields within the last few years, it has become an increasingly difficult problem to know what portions of a subject to stress for beginning students and what portions to leave out. Although it is impossible for the average medical student to grasp all of the subjects in his crowded curriculum in any great detail, it certainly seems necessary that students not only should be well trained from the point of view of a "trade school"—that is to say, with respect to histology, that they should be able to recognize tissues and organs for their later work in pathology—but also should learn something about the present growing points of the science, something of present-day problems and methods of investigation. Students beginning

a course early in their medical curriculum should also acquire something of the scientific attitude and be trained in critical evaluation of facts. In other words, a course such as histology is of value to the medical student not only for its own sake but for the purpose of training the student to think, since it comes early in the curriculum.

Cowdry has written a textbook from a new point of view. He has omitted many structures ordinarily studied in a course in histology and has stressed particularly those of which considerable physiologic information exists. He has considered the blood vascular system as the great integrator of the body and has presented the various organic systems in relation to the body as a whole, and particularly their relation to the blood vascular system. If the student is able to grasp the correlation between structure and function by means of a textbook of this kind, he will have acquired much more valuable information than by merely crowding his memory with mental images of histologic preparations. Cowdry justly makes the criticism that most textbooks of histology repeatedly illustrate the obvious, and he has not attempted to illustrate structures which (according to his theory) the student can study for himself in the usual collection of microscopic material handed out in courses of histology. He has taken his references for the most part from the classic literature or from quite recent articles and on the whole has tried to be impartial in his conclusions. In many places, however, he has accepted as facts statements made in the recent literature without explaining thoroughly enough the methods by which such conclusions were reached and in a few instances has swallowed work of dubious value whole. A book of this kind, courageously written, could not help but be one sided in many subjects, but it is well to let beginning students know that there are still problems to be solved in histology, a conception they will never get from most other textbooks. Most of the illustrations are excellent, and many of the data of the various systems of the body are summarized in tables. There is too much cytologic detail to be of use to medical students. The references have been well chosen; they are references from which students who wish to do more than the minimum required amount of work in the course would get the most benefit. It remains to be seen whether freshmen medical students will be able to comprehend the text, and to learn histology from slides without some sort of atlas or picture guide. But Cowdry is on the right track: surely medical students can grasp important generalizations without cramming, parrot-like, all the insignificant details of a subject, only one of many, after all, in their curriculum.

Schafer has many more illustrations, mainly from photographs, than in previous editions, most of them good; but otherwise the plan of the book remains much the same as in former editions. This textbook is primarily an objective atlas with less text than any of the other textbooks of histology and has always been a valuable laboratory manual for the students to use while they are looking at slides. It is exactly the sort of "picture book" which Cowdry has criticized. Medical schools devoting a minimum amount of time to the course in histology will probably find this book of greatest value in teaching students the essentials of the subject, as the title states. The text has always been quite conservative but it is didactic in the usual British medical school compend manner, and necessarily many of the statements are inaccurate and unjustified in the light of the most recent work in histology. This textbook contains more neuro-anatomy than the other textbooks of histology. In the United States most medical schools have a separate course in neuro-anatomy and the chapters on the nervous system in this textbook do not fill the requirements of a textbook on neuro-anatomy. This textbook then can be recommended not as the best textbook of histology but as the best short textbook for students with a minimum of time.

Jordan has gone to considerable pains to bring his best seller of previous years down to date. But many of the illustrations are quite unsatisfactory (there are too many diagrams) and the text is not concisely enough written from the standpoint of a medical student with a crowded curriculum. Just for example, the illustration labeled "active human mammary gland" on page 469 is more typical of a mammary gland of pregnancy than of a lactating gland. There are many inaccuracies in the text, mainly due to quotations from the older literature. It is well for the students to have reference to classic papers that represent an actual advance in our knowledge of a scientific subject, but there is no point in giving space to old papers of doubtful value. If we must have quotations from the literature, let us have the most recent literature on the subject. There is insufficient reference in this textbook to the physiologic aspects of organs, although more than is to be found in Schafer.

One of the greatest difficulties that a freshman medical student has is correlating the information he acquires in his anatomic courses and his physiologic courses. From this point of view the best textbook of the series being reviewed is the one by Cowdry.

Medical students who are to meet only human tissues henceforth should acquire a familiarity with the microscopic appearance of human material primarily. There are so many differences in the histology of human material and material from the common laboratory animals that unless the student has enough time allotted to his course in histology to allow him to learn considerable comparative histology it is far wiser to restrict his time to the study of human material. To be sure, much of our most valued information has been obtained from experimental animals, but there is no point in having a medical student learn the microscopic appearance of a uterus that does not menstruate, of a pig's liver with its large amount of interlobular connective tissue, or of a dog's thymus, whose life cycle differs so widely from that of the human being. This statement presupposes that the human material must be adequately preserved to show the normal structure. Many of the illustrations in Schafer and Jordan, therefore, are unsatisfactory—but Cowdry's fewer illustrations meet this objection.

The moral of this comparative review is that probably any textbook is good enough. Medical sciences are so interlocking that the medical student will probably compensate for the deficiencies in any one course by the information he acquires in his other courses.

Die Kinder männlicher und weiblicher Morphinisten (Frage der Keim- und Fruchtschädigung, Erbgang der Psychopathie). Von Prof. Dr. Kurt Pohlisch. Boards. Price, 5.80 marks. Pp. 82. Leipzig: Georg Thieme, 1934.

The author reviews experimental proof of alterations of hereditary factors in animals and plants due to environment; for instance, mutations characterized by changes in the eye, wings and body color in the fruit fly (Drosophila) following exposure to x-rays. Changes in lower life following exposure to solutions of chemicals have been less pronounced. Proof of mutations in man due to certain environmental agencies, such as alcohol, is questioned. He considers morphine addiction a fertile field for this type of genetic analysis. The sexual functions are usually inhibited and the toxic period of the subject's life is sharply separated from the normal.

A total of 1,929 adult addicts, 1,348 male and 581 female, were genetically analyzed. The children produced before or after (115) and during the period of addiction (280) were examined for mental and physical defects. Those born during the period of addiction of one or both parents were 69.6 per cent normal, 25.8 per cent psychopathic (without psychosis), 2.9 per cent feebleminded, 1.2 per cent epileptic and 1.4 per cent physically defective. Those born before or following the period of addiction of the parents were 68.9 per cent normal, 26.2 per cent psychotic, 3.9 per cent feebleminded, 1.0 per cent epileptic and 1.8 per cent physically defective. The comparative study showed no significant difference in the two groups. Furthermore, the parents and other close blood relatives showed a similar high percentage of defects. The descendants of four addicts were traced to the second and third generations with similar results. The observations indicated that the defects are inherent and transmissible and not due to the use of morphine.

Considerable space is devoted to an analysis of the course of pregnancy and confinement of sixty-two addicted mothers. An increase in fetal movements occurred when the usual dose of morphine was decreased or delayed. Premature births were frequent. Abstinence symptoms, similar to the syndrome observed in adults, appeared shortly after birth and increased in severity up to the third day, unless morphine was administered or the mother's milk became established. The infant

mortality was high (14.3 per cent), usually occurring on the second or third day, owing to abstinence. There was considerable delay in development during the first month of life, but thereafter the infants progressed favorably. Certain infants were also found to develop abstinence symptoms when deprived of the mother's milk, showing that they received a sufficient amount of morphine from this source to maintain addiction.

The mental characteristics of the usual confirmed addict are described and certain general differences noted from those peculiar to the alcohol addict. The question of sterilization is discussed. The apparent decrease in the prevalence of addiction, the fact that the average age level is higher than formerly, and the comparative sterility of the morphine addict are cited as factors against the sterilization of this group in Germany.

Benign, Encapsulated Tumors in the Lateral Ventricles of the Brain: Diagnosis and Treatment. By Walter E. Dandy, M.D., Adjunct Professor of Surgery, Johns Hopkins University. Cloth. Price, $4.50. Pp. 189, with 83 illustrations. Baltimore: Williams & Wilkins Company, 1934.

This monograph deals with a pathologically heterogeneous group of encapsulated tumors, which were situated in the lateral ventricles of the brain. That the author, among the thousands of brain tumors recorded in the medical literature, was able to find only twenty-five similar tumors indicates that the book deals with a great rarity. One might ask why a monograph should be written on such a rare condition, which has no constant clinical or pathologic characteristics. The answer is given in the introduction—to point again to the value of ventriculography, now generally recognized. The book abounds in dogmatic statements. That "this precision in diagnosis [by ventriculography] is not only easy and certain but is attainable without risk to life or function" is not strictly true. The author has been able to find in the literature only one other such tumor disclosed and removed at operation; he overlooked, among others, the case of Cushing (Studies in Intracranial Physiology and Surgery, Oxford Medical Publications, 1925, pp. 42-43), which was calcified and visible in the roentgenogram though the author states that the one of Barré and Metzger is "the only one in the literature." Many will be surprised to find that any one ever thought or taught that "every tumor below the surface of the brain is a glioma" (in quotation marks in the book but reference not given). "There are now no tumors giving signs or symptoms that cannot be accurately diagnosed, precisely localized and disclosed at operation." Perhaps, but not necessarily removed; for the author goes on to say "The other . . . invasive tumors . . . give signs and symptoms that are all too frequently indistinguishable from those of the encapsulated type." The statement "It is far better to apply the term 'ependymal glioma' to a tumor that by practical test is sharply differentiated from all other gliomata in the brain" is simply absurd. The statement on page 30 that tumors of the choroid plexus "metastasize through the blood to all parts of the body" is unjustified by the evidence given. There is no proof that the tumor of Atlee arose from the choroid plexus. It is useless to multiply further such citations. After a consideration of small primary tumors not giving symptoms and of malignant tumors, the author begins a detailed and profusely illustrated account of his fifteen cases. The case reports are sometimes carelessly written. For example, in case I, page 9, it is stated that "there is no iron pigment," whereas the subtitle to figure 2*A* says "The small black masses are iron pigment." In case III the subtitles of figures 4*A* and 4*B* seem to be reversed. The tumor in case VII is obviously of leptomeningeal origin. Case X is not a ventricular tumor, as the author admits. The tumor in case XI is also obviously a leptomeningioma. There follows a detailed analysis of the signs and symptoms, the upshot of which is that there are no characteristic signs and symptoms. The next chapter points out that these tumors must be localized by ventriculography and states that "the use of ventriculography has made it possible to overcome all the diagnostic defects in this group of tumors." Not quite all: the author does not tell how many times he has been misled into performing useless explorations for malignant invasive tumors. The chapter on treatment illustrates again the well known technical virtuosity of the author. The author's cases are a welcome addition to the casuistics of brain tumors.

Considérations sur l'étiologie des maladies infectieuses. Par le Docteur Rappin, professeur honoraire de l'Ecole de médecine. En collaboration avec M. le Docteur Doussain, médecin à Clisson (Loire-Inf.). Paper. Pp. 136, with illustrations. Nantes: Imprimerie de Bretagne, 1934.

In the preface the author acknowledges that his opinions are contrary to predominating doctrines. However, he believes that even as Pasteur abandoned ancient conceptions the time will come through an evolution of ideas relating to pathology and heredity when many modern views will be abandoned and old concepts be reborn. The book philosophizes on general pathology and the etiology and pathogenesis of infectious diseases. The contents are based on observations and studies made during the life of the author. He refers to the discovery of filtrable viruses and the era before Pasteur, discusses much of Pasteur's work, and mentions the latter's impetuosity in defending his opinions. There are portrayed some of the advances made in bacteriology, and this is accompanied by a discussion of the origin of disease and of epidemics. Influenza, cerebrospinal meningitis and diphtheria are among the infectious diseases considered from an epidemiologic point of view. Considerable attention is given to the spontaneous origin of infectious disease and outside influences. Cancer is referred to as an infectious disease the origin of which is within the body and is cited as an example of this theory. There are frequent quotations from many investigators, past and present. The author states that all real human science tends toward the realization of two great problems, the nature of matter and the nature of life. He places much credence in the views of the ancients concerning the influence that climatic and meteorological conditions have on disease. He says we are entering on a new era in the study of disease and must consider it in relation to exterior and cosmic elements. The book sets forth a sequence of events in the progress of bacteriology. It is attractive from a historical standpoint. It presents an interesting philosophy relating to the future study of disease by one well qualified to express his views.

Recent Advances in Allergy (Asthma, Hay-Fever, Eczema, Migraine, etc.). By George W. Bray, M.B., Ch.M., M.R.C.P., Physician in Charge of Children's Department, Prince of Wales Hospital, London. With foreword by Arthur F. Hurst, M.A., M.D., F.R.C.P., Senior Physician, Guy's Hospital. Second edition. Cloth. Price, $5. Pp. 503, with 106 illustrations. Philadelphia: P. Blakiston's Son & Company, Inc., 1934.

The fact that a second edition has been called for within three years after the first one is proof of the excellence of the book. The author has the unique ability to say what he wants in a brief and lucid manner. His language is simple and readily understandable. His sayings are especially effective; for example, he says "It is interesting to note that the best results have always been obtained by the original observer and poorer results by subsequent investigators." His tables are good, and after he quotes the literature, which he does extensively, he summarizes the observations briefly and then gives his own opinion in intelligent fashion. The book covers the subjects of asthma, hay fever, eczema, migraine and the other allergic diseases and has a fair dissertation on these sicknesses. The discussion of the relationship of the nose and nasal sinuses to allergy is an extremely fair one and reconciles many of the arguments between the allergists and the nose and throat specialists. Although Bray's experience has been chiefly with children, and his own opinions are necessarily derived from observations on children, he includes so much work on adults that the book is helpful to all those interested in allergy. On a few minor points one must disagree with the author. He favors group skin tests, a system that makes the finding of positive reactions more difficult. He includes enuresis as an allergic phenomenon; this is quite doubtful. He sterilizes his syringes and needles by running them through a sterile saline solution. He condemns the use of ultraviolet radiation in bronchial asthma (many investigators think this procedure quite valuable). In his next edition, which one hopes will be forthcoming in a few years, the author should devote much more space to the section on the elimination of the specific causes of bronchial asthma. This portion of the book is very weak and much too brief and implies a lack of success. No mention, for example, is made of the fact that it is necessary to eliminate thoroughly foods to which the child is hypersensitive. In general, however, the book is an excellent one for allergists, for general practitioners and for advanced medical students.

Praktische Psychiatrie. Von Primarius Dr. med. et phil. Friedrich Schulhof. Paper. Price, 10.50 marks. Pp. 496. Berlin & Vienna: Urban & Schwarzenberg, 1934.

This book is written for the general practitioner; it has some shortcomings and many virtues, the latter being definitely more numerous. The book is addressed to Austro-German physicians, the bulk of whose patients are still treated in their homes even under circumstances that in America are considered to render hospitalization imperative. Part of the book is consequently devoted to detailed instructions on how to administer hydrotherapy and other therapeutic measures in the home. Even this, however, is of benefit to any one not experienced in institutional work. There is also a tendency to deal dogmatically with problems of pathogenesis and etiology. Aside from these rather negligible faults, the book may safely be recommended to any one who desires to orient himself in the field of psychiatry and demands a manual that is neither too technical nor too simple. The chapters on psychopathic personality, epilepsy and alcoholism are especially well done, a feature that renders the book more valuable to the practitioner.

Essentials of Injection Treatment of Internal Hemorrhoids. By Thomas F. McNamara, M.D., Staff of St. Mary's Hospital, Rochester, N. Y. Foreword by Benedict J. Duffy, M.D., Chief of Staff of St. Mary's Hospital. Fabrikoid. Price, $3.50. Pp. 117, with 6 illustrations. Rochester, N. Y.: Medical Press, 1934.

This work covers largely the author's technic in the treatment of 1,100 cases of internal hemorrhoids. Injection methods were used exclusively. In view of the well known tendency to recurrence after such treatment, his case might be more convincing if his work included a record of a follow up to show how large a proportion of his cases recurred. The same is true of his practice of "snipping off" hypertrophied papillae. If this alone prevents their recurrence, his experience will be exceptional. There are interesting clinical anecdotes illustrating the author's tact and sagacity in handling patients, and the detailed directions may prove helpful to practitioners who wish to use this method exclusively.

Grundzüge der pathologischen Physiologie. Von Dr. med. Hans Lucke, Privatdozent für innere Medizin in Göttingen. Paper. Price, 6.60 marks. Pp. 195. Berlin, Julius Springer, 1934.

As the author states in the preface, the purpose of his book is not to offer a review of normal and pathologic physiology or clinical symptomatology, but to summarize for the students in a practical way the underlying processes responsible for the corresponding clinical and laboratory observations. An attempt to elucidate complicated scientific problems has been intentionally dropped. As the book is to serve merely as an introduction to the study of pathologic physiology and is not competing with more exhaustive works, bibliographic references are omitted. The text is subdivided into chapters on special organic metabolism, vitamins, hormones, total metabolism, mineral and water metabolism, formation of sediments and stones, blood, pigments, respiration, circulation, urinary organs, digestion, the nervous system, thermoregulation, infections, immunity and allergy. One finds a few omissions which for completeness should be included; for instance, bacteriophage and the patch test for allergy. The book is thoroughly modern, covering every recent advance of real value, and contains a wealth of material presented in a simple, concise manner. A perusal of the book will prove of great value not only for students but also for graduates who wish to refresh and replenish their knowledge of this important subject.

Good Food at Low Cost. By R. T. Devereux, M.D., Pediatrician, Chester County Hospital. Introduction by S. C. Schmucker, Ph.D. Chester County Emergency Child Health Committee. Under the Auspices of the Chester County Medical Society. Paper. Pp. 38. Westchester, Pa.: The Society, 1934.

This book, intended for the housewife, is a result of the nutrition program of the Chester County Emergency Child Health Committee formed under the auspices of the Chester County Medical Society and as a unit of the Emergency Child Health Committee of Pennsylvania. It states in simple and practical form some of the latest information on foods for promoting the proper feeding of people, especially children. Recipes and menus with an explanation of the essential foods and the methods for their purchase and preparation are included. The less money to spend for food, the more important it is to spend it wisely. The booklet serves the purpose of instructing on this problem and should enable the average citizen to prepare well balanced diets at low cost. It will be especially helpful to those interested in the emergency feeding of the poor.

Medizinische Kolloidlehre. Herausgegeben von Prof. Dr. L. Lichtwitz, Dr. Dr. Raph Ed. Liesegang und Prof. Dr. Karl Spiro. Lieferung 12. Paper. Price, 5 marks. Pp. 849-928, with 1 illustration. Dresden & Leipzig: Theodor Steinkopff, 1934.

This instalment deals, first, with the relation between pharmacology and colloid chemistry. Starkenstein reminds us that all biologic manifestations must ultimately be referred to colloid chemical alterations. Disease, poisoning and cure are all results of such changes. Colloid chemistry has decided the age old controversy between humoral and cellular pathology in favor of both, for the entire living body is a colloidal solution. As examples of the revolutionary change in view that colloid chemistry has forced on pharmacology, the author discusses briefly the newer understanding of diastatic ferment action, of the adsorption and distribution of remedies, of diuretics and diaphoretics, of inhibition of inflammation, and of drug influences on purine metabolism. No less profound and enlightening is Liesegang's chapter on "Strahlentherapie," which attempts, by giving numerous references to recent literature, to open up the treasury of the latest views to those who have not been able to keep abreast of some of the most recent advances in the biology of irradiation. Hans Moser's chapter on dressings is as full of practical suggestions as are the others of theoretical interest. The work is maintaining in this instalment the high standards set by previous ones.

Chirurgie du pancréas. Par P. Broeq, professeur agrégé à la Faculté de médecine de Paris, et G. Miginiac, professeur à la Faculté de médecine de Toulouse. Paper. Price, 75 francs. Pp. 427, with 75 illustrations. Paris: Masson & Cie, 1934.

Instead of "Surgery of the Pancreas," a more appropriate title for this monograph would be "Surgical Diseases of the Pancreas," as of 427 pages only one and one half (in the chapter on injuries of the gland) are devoted to the description of the surgical approach. There are chapters on traumas of the pancreas, acute pancreatitis, chronic pancreatitis, cysts, syphilis, tuberculosis, stone formation, fistulas, malignant tumors and anatomic anomalies of the gland. In each chapter a short historical review is followed by a discussion of the etiology, pathologic anatomy, pathogenesis, clinical manifestations and treatment of the described lesion. Case reports and statistical data are abundant, illustrations scanty; numerous writers are mentioned by name, but bibliographic references are lacking, certainly an inexcusable omission in a monographic type of work. The recent trend to a more conservative treatment, postponing the operation till the "shock stage" is passed, did not receive any consideration. While these shortcomings detract considerably from the value of the work, this is nevertheless a significant contribution to the French medical literature.

Hamlet: An Analytic and Psychologic Study. By Fayette C. Ewing, M.D. Paper. Price, 50 cents. Pp. 32. Boston: Stratford Company, 1934.

Ernest Jones, writing in the *American Journal of Psychology* (**21**:72 [Jan.] 1910) on the "Oedipus complex as an explanation of Hamlet's mystery, a study in motive," speaks of "those Shakespearian critics who have enjoyed no special opportunities for penetrating into the obscurer sides of mental activities and who base their views of human motive on the surface valuation given by the agents themselves—to whom all conduct whether good or evil at all events springs from conscious sources." To this category seemingly belongs the author of this short essay, which is written almost entirely in the literary style and is hardly analytic or psychologic according to the lights of modern psychopathology. Dr. Ewing, who is apparently quite well versed in Hamlet lore, having for many years collected all he could find that has been published by physicians concerning the mental stability of Hamlet, contents himself with a simple objective study to show that Hamlet was sane. The old quarrel as to whether or not Hamlet feigned a psychosis is revived by citing passages from the play, and the conclusion is offered that the prince of Denmark acted as any reasonable individual would under similar trying circumstances. Nothing new is added

to clarify the great riddle of Shakespeare's most distinguished character, for this particular ground has been gone over time and again by scores of psychiatrists. A work such as that of Jones, which penetrates deeply into the more important matters of the motivations and mechanisms of the mind and the unconscious behavior of Hamlet, lends considerably more to the unraveling of the main problem, which essentially consists in the cause of Hamlet's hesitancy in seeking to obtain revenge for the murder of his father. Dr. Ewing's venture is more a labor of love than a scientific psychologic study.

Medicolegal

Medical Practice Acts: Licensed Practitioner Convicted of Practicing Medicine Without a License.—F. B. Needham and A. H. Bray were convicted of "practicing medicine without a license," in that they unlawfully treated a woman for a supposed cancer of the breast. They appealed to the criminal court of appeals, Oklahoma.

Needham was not a licensed physician in Oklahoma, although he had for a number of years operated the Needham Cancer Sanitarium, in Oklahoma City. Bray apparently had a license authorizing him to practice medicine in Oklahoma. The evidence on behalf of the state showed that Needham and Bray told the patient that a secret formula of Needham's, a paste, when applied to the human flesh would destroy cancerous growths, if present, but that if there was no cancer the paste would not burn the flesh. By this method, they said, it could be determined if cancer was present. At their solicitation, the woman finally submitted to the test. Shortly thereafter she felt a burning sensation in her breast and returned to the sanitarium. Needham and Bray told her that the test was positive proof that she had cancer and, for an additional fee, they gave her additional treatments. Needham applied the paste and Bray covered it with tape. Subsequently, when the pain in her breast became unbearable, the woman was taken to a hospital, where physicians removed the paste and tape revealing "a shocking physical condition." The state chemist testified that he had made a chemical analysis of paste similar to that used on the woman and that it had a heavy test for zinc, a heavy test for chlorides, and "the gummy substance had a high content of zinc chloride." Zinc chlorides, he testified, have a caustic and erosive reaction and cause burns and blisters on the human flesh whether cancerous or otherwise.

The theory of the defense was that instead of Bray assisting Needham, Bray was the actual practitioner and that Needham only assisted him in emergencies. Testifying in their own behalf they both admitted the only treatment used in the sanitarium was Needham's so-called secret formula and that Needham applied the paste and Bray did the taping in the treatment administered to this particular woman. Four treatments, in all, were given to the woman, they testified, Bray being present for the first two treatments and Needham applying the last two in Bray's absence. The fees received for the treatment of all patients, they testified, were divided, one third going to Bray and two thirds to Needham. Bray was employed by Needham to take charge of the sanitarium and conduct the treatments, they claimed, and that while Needham sometimes assisted Bray, he never acted alone except in emergencies.

Many errors were complained of by the appellants, said the criminal court of appeals, but since their own evidence clearly showed them to be guilty of the offense charged, the judgment of the trial court must be affirmed unless the errors complained of are of such a fundamental nature as to require a reversal. Among other things, the appellants contended that the trial court erred in refusing to permit the introduction of evidence showing that Needham had consulted attorneys, including the county attorney, and had been advised by them that if he employed a regular licensed physician to conduct his sanitarium he would not be violating the law. Counsel for the appellants admitted that they could find no authorities to support this contention. This was not surprising, observed the court, since there probably are no such cases. The trial court properly rejected this evidence. An accused cannot prove as a defense that he acted on the advice of counsel in committing the act complained of, because if such were the law it would be placing the advice of counsel above the law itself. Each person charged with an offense must know what the law is, and he acts at his own peril. After examining the entire record, the criminal court of appeals concluded it to be apparent that the errors complained of were not such as to result in any material injury to the appellants and the judgment of conviction was affirmed.[1]—*Needham and Bray v. State (Okla.), 32 P. (2d) 92.*

Malpractice: Judgment in Suit for Fee as Bar to Subsequent Action for Malpractice.—The defendant-physician obtained in a justice's court a judgment against the plaintiffs for the reasonable value of the services rendered by him in treating their child. In contesting the payment of this fee, the plaintiffs contended that the services rendered were valueless, in that the physician did not exercise the degree of care, skill and intelligence required of physicians and surgeons in the locality. Subsequently, the plaintiffs instituted the present suit against the defendant-physician to recover damages for alleged malpractice in treating the child. The trial court gave judgment for the defendant, holding that since the question of negligent treatment had been adjudicated in the suit instituted in the justice's court and had been determined in favor of the physician, the judgment of the justice's court constituted a bar to the instant suit for damages based on alleged negligence. The plaintiffs appealed to the district court of appeal, second district, division 2, California.

The plaintiffs contended that since a justice's court was not a court of record, it was impossible to tell what matters were actually litigated and that the judgment rendered in the justice's court did not show on its face that the question of negligent or careless treatment was litigated. But, said the district court of appeal, a reporter's transcript and the pleadings and instructions to the jury did show that this question was presented to the court and jury, and even though it had not been specifically set up as a defense, the question was necessarily involved. "A physician or surgeon taking charge of a case," continued the court, "'impliedly represents that he possesses, and the law places upon him the duty of possessing, that reasonable degree of learning and skill that is ordinarily possessed by physicians and surgeons in the locality where he practices.' *Hesler* v. *California Hospital Co.*, 178 Cal. 764, 766, 174 P. 654, 655. If he does not possess such learning and skill, or if, possessing it, he fails to use it, he is guilty of malpractice; and in every action to recover for services rendered by a physician or surgeon in which either the lack of skill and learning are necessarily involved, it needs no argument to demonstrate that a physician or surgeon who does not show at the trial that he possesses such skill by proving that he is licensed to practice his profession, and at least by presumption that he used the same in performing the services rendered, would not be entitled to recover. In other words, in our opinion, such questions are actually and necessarily included in an adjudication of his right to recover even in a default case, and particularly so where, as here, an answer is filed which expressly raised an issue thereon, which was presented for decision as here shown." The district court of appeal, therefore, agreed with the trial court that the adjudication on the question of negligent or careless treatment by the justice's court was conclusive on that question, and barred the plaintiffs from prosecuting the present action.—*Olney v. Cavell (Calif.), 32 P. (2d) 181.*

Pharmacy Practice Acts: Conclusiveness of Finding That Applicant Is of Good Moral Character.—In November 1927, Watkins was granted a pharmacist's license in Louisiana, after examination. He subsequently moved to Mississippi and in 1931 was there licensed as an assistant pharmacist. In 1932 a law was enacted in Mississippi (Laws, 1932,

1. Bray, although a licensed practitioner, was convicted of practicing medicine without a license apparently by virtue of section 1808, Oklahoma Statutes, 1931: "All persons concerned in the commission of crime, whether it be felony or misdemeanor, and whether they directly commit the act constituting the offense, or aid and abet its commission, though not present, are principals." Since Bray assisted Needham unlawfully to practice medicine he himself also became liable as a principal under the Oklahoma statute quoted.

c. 277) making it mandatory that the state board of pharmacy license as a registered pharmacist any person of good moral character who had, after examination, been licensed to practice pharmacy in another state prior to Dec. 31, 1927. Watkins applied to the Mississippi state board of pharmacy for a pharmacist's license, but the board took no action on his application. He then brought mandamus to compel the board to issue the license. The trial court ordered the board to act on the application but it declined to command the board to issue the license, seemingly holding that the board should pass on Watkin's good moral character. Watkins appealed to the Supreme Court of Mississippi, division B.

Since the Mississippi pharmacy practice act, said the Supreme Court, requires that all applicants for assistant pharmacists' licenses prove their good moral character, the issuance of such a license to Watkins in 1931 was a recorded adjudication by the board that he was of good moral character, which is conclusive on the issue. The board urged, however, that when Watkins applied for a license to practice as an assistant pharmacist, only a superficial examination was made into his moral character and that the board now intends to make a thorough investigation. But, answered the court, the board cannot be heard to say that it failed in its duty fully to investigate into Watkins' good moral character prior to issuing him an assistant pharmacist's license. Public judicial and quasi judicial records must rest on a more secure foundation than would be the case if any such contention as the board now makes were allowed to prevail. Nor may the force of the former adjudication as to Watkins' good moral character be avoided by a suggestion that there may have been a change in that regard. The legislature has authorized a review of judgment on that issue only in proceedings to revoke a license and the only causes, stated in the statute, justifying revocation of a license is the conviction of the holder of unlawfully selling habit-forming drugs or intoxicating liquor. The court pointed out, moreover, that there was no intimation in the record that Watkins was not at present of good moral character.

The court accordingly reversed the judgment of the lower court and directed the state board of pharmacy to issue Watkins a license to practice as a registered pharmacist.—*Watkins v. Mississippi State Board of Pharmacy (Miss.), 154 So. 277.*

Workmen's Compensation Act: Lymphatic Leukemia Allegedly Aggravated by Trauma.—At the time of his death in January 1931, Kizer was 59 years old. Until December 1930 his general health had been good, although for several years previously he had varicose veins in both legs. Sometime in December 1930, red spots, varying in size from a dime to a quarter, appeared on both of his feet, some of his toes were swollen, and at times the varicose veins pained him, but he did not consult a physician. On Jan. 12, 1931, in the course of his employment, he bruised the calf of his left leg. The following day he had to cease work and go home. He never worked thereafter. January 16 he went to a clinic for examination, where it was ascertained that he had a white cell count of 119,000 per cubic millimeter and "hemorrhagic bleeding" under the skin of the calf of the left leg at or near the point where it had been bruised. On January 19, "hemorrhagic bleeding" appeared under the skin of the calf of the right leg. The following day the bruise or red blotch on the calf of the left leg was improved and was "fading out" but the blotch and "hemorrhagic bleeding" on the right leg were worse. On January 27, Kizer was found in a stupor, with partial paralysis. He was taken to a hospital, where he died that day. His blood count on his entrance to the hospital was over 400,000 per cubic millimeter. After autopsy, death was attributed to acute lymphatic leukemia. Claiming that death was due to complications arising from the bruise on his left leg, received in the course of his employment, his widow sought compensation under the Nebraska compensation act. From a judgment of the district court, Lancaster County, affirming the refusal of the compensation commission to award compensation, the widow appealed to the Supreme Court of Nebraska.

For the claimant to recover compensation, said the Supreme Court, she must show with reasonable certainty that the workman's death was caused by injuries resulting from an accident arising out of and in the course of his employment. This, the court concluded, the widow failed to do. The testimony of medical experts called by the employer and his insurance carrier amply sustained the conclusion reached by the commission and by the lower court that there was no proof adduced of any relationship between the industrial injury complained of, the bruise, and the acute lymphatic leukemia of which the workman died. These experts testified that medical authorities are unanimous in the opinion that trauma can neither cause acute lymphatic leukemia nor aggravate it. These experts denied that the bruise on the calf of the workman's left leg, received on January 12, in any manner caused or contributed to his death on January 27. Only one medical expert, called by the widow, testified that the trauma was a contributing cause of the death. The Supreme Court accordingly affirmed the judgment of the lower court denying compensation to the widow.—*Beatrice Creamery Co. v. Kizer (Neb.), 254 N. W. 690.*

Pharmacy Practice Acts: Sale of Aspirin and Citrate of Magnesia.—Four prosecutions were instituted under the pharmacy practice act of California. The defendants were found guilty in each case and they appealed to the appellate department, superior court, Los Angeles County, where their appeals were consolidated.

In two of the cases the defendants were charged with operating pharmacies, stores or shops where drugs were sold at retail, without having registered pharmacists in charge thereof. By section 1 of the pharmacy practice act, said the court, a store or shop where drugs are sold at retail is not a pharmacy, for the purposes of the act, unless a sign containing the words "pharmacist," "pharmaceutical chemist," "apothecary," "druggist," "pharmacy," "drug store" or "drugs" is on the store or in it. The complaints failed to allege, and there was no proof adduced to show, that one of these signs was on or in the store owned by the defendants. The court accordingly reversed the convictions in these two cases.

In the two other cases the defendants were charged with selling drugs and medicines, to wit, aspirin and citrate of magnesia, without being registered under the pharmacy practice act. The defendants contended that the complaints in their cases were defective because they did not negative the exceptions contained in the pharmacy practice act. The court held that exceptions need not be negatived in a complaint. Further, the court held, it was not reversible error for the trial court to permit a certain witness to testify that aspirin and citrate of magnesia are drugs or medicines, despite the fact that the witness was not qualified so to testify. Courts take judicial notice that these two substances are drugs or medicines, said the court. The defendants also contended that the sale of aspirin and citrate of magnesia was excepted from the operation of the pharmacy practice act by section 12, which provides that the act shall not apply to "registered, trade marked, or copyrighted proprietary medicine, registered in the United States Patent Office." To bring an article within this exception, said the court, two things are necessary: (1) the article must be a proprietary medicine, and (2) it must be "registered, trade marked, or copyrighted . . . registered in the United States Patent Office." We are not required to determine whether or not the two articles are proprietary medicines, continued the court, because, even if it be assumed that they are, the record contained no evidence that the articles had been registered, trade-marked, or copyrighted in the United States Patent Office. But because of an error in assessing penalties on these defendants, the cases were remanded to the trial court with directions to impose the proper penalties.—*People v. Garcia (Calif.), 32 P. (2d) 445.*

Malpractice: Award of Compensation as Bar to Suit for Malpractice.—A workman, says the Supreme Court of Oklahoma, may recover from the employer under the Oklahoma workmen's compensation act not only for an industrial injury but also for any aggravation thereof due to the malpractice of the physician selected by the employer. Under such circumstances, an award of compensation under the compensation act will bar a suit for damages for malpractice that the workman subsequently institutes against the physician.—*Markley v. White (Okla.), 32 P. (2d) 716.*

Society Proceedings

COMING MEETINGS

American Orthopsychiatric Association, New York, Feb. 21-23. Miss Mary A. Clarke, 50 West 50th Street, New York, Secretary.

Annual Congress on Medical Education and Licensure, Chicago, Feb. 18-19. Dr. William D. Cutter, 535 North Dearborn Street, Chicago, Secretary.

Pacific Coast Surgical Association, Santa Barbara, Calif., Feb. 21-23. Dr. Edgar L. Gilcreest, 384 Post Street, San Francisco, Secretary.

Southeastern Surgical Congress, Jacksonville, Fla., March 11-13. Dr. Benjamin T. Beasley, 478 Peachtree Street, N.E., Atlanta, Ga., Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH

Seventh Annual Meeting, held in Chicago, Nov. 2 and 3, 1934

(Concluded from page 150)

The Diagnostic Features of Acute Pancreatitis

DR. EDWIN G. BANNICK, Rochester, Minn.: Acute pancreatitis is usually incorrectly diagnosed. The usual textbook description, since it applies to the rare fulminating hemorrhagic case, is misleading in most instances. The more common and milder cases usually are mistaken for severe cholecystic disease. These observations are confirmed by a careful study of the records of forty-seven patients whose symptoms were proved by surgery or necropsy to have been due to acute pancreatitis. Certain facts brought out in this study should result in more accuracy in the diagnosis, treatment and prognosis.

DISCUSSION

DR. S. A. SHELBURNE, Dallas, Texas: I wonder if Dr. Bannick had the opportunity to do the dextrose tolerance test in the acute cases. I had the privilege of observing over a long period of time a man with recurrent attacks of pancreatitis, the symptoms of which fit in with those mentioned here. A few hours after the worst symptoms had subsided, I did a dextrose tolerance test. This man showed the most profound changes. The blood sugar was elevated to 350 or 400 mg. per hundred cubic centimeters and the urine always showed sugar. I saw him in three distinct attacks at intervals of four months and repeated the studies in each attack. Within ten days or two weeks after the attack the dextrose tolerance test was entirely normal.

DR. E. L. TUOHY, Duluth, Minn.: In the larger group that was proved by operation, what was the degree of fat necrosis found at operation?

DR. JOHNSON MCGUIRE, Cincinnati: Was cyanosis of unusually marked degree noted in these cases? In the few cases that I have seen in which the diagnosis of acute pancreatitis was confirmed by operation or autopsy, cyanosis was extreme and out of proportion to the cyanosis that one observes in any other acute abdominal condition.

DR. EDWIN G. BANNICK, Rochester, Minn.: As to the dextrose tolerance, I do not think there is any doubt that the results reported by Dr. Shelburne would be the case. In the cases that I reported the diagnosis was unsuspected and these records show only the ordinary urinalysis, and in only a few was the blood sugar determination made. I am convinced that if blood sugar determinations were made in every suspected case of acute pancreatitis there would be a higher incidence of carbohydrate disturbance than was noted in my series of cases and, of course, a dextrose tolerance test would probably show a still higher incidence. In regard to the question concerning the conditions found at operation, all of these cases were either surgical or postmortem cases. I included no case that did not show some degree of fat necrosis. In selecting these forty-seven cases I passed over a good many in which a definite pancreatitis was present but cholecystic disease, such as empyema of the gallbladder, was so severe that it would have been difficult to evaluate the symptoms and changes that were due to the pancreatitis, and this was my chief idea in collecting this group of cases. The question of cyanosis in acute pancreatitis has been raised. I don't know just what it is due to, but there is no doubt that it occurs in some cases, particularly the hyperacute group. I have noted it in a few cases, and it has been a peculiar sort of cyanosis and particularly noticeable in the face and abdomen. I rather doubt the diagnostic value of this observation, but it probably adds a little something to the picture when taken as a whole.

Gastroscopy: Present Status and Value in Diagnosis of Gastric Disease

DR. RUDOLF SCHINDLER, Chicago: The invention of the flexible gastroscope has overcome the chief difficulties of gastroscopy. The examination can be conducted on the ambulatory patient. It can be done with greater ease and less discomfort to the patient, the danger of perforation is practically eliminated, and it permits a wider field of vision than was possible with the rigid instrument. Gastroscopy is of great importance in determining the frequency of chronic gastritis, the correlation of its appearance with the clinical picture, and to evaluate therapeutic procedure. It has a wide application in observing gastric ulcer. Duodenal and pyloric ulcers are not favorably situated for this direct examination. Benign tumors of the stomach are easily seen, and in all probability beginning carcinomas can be located better by the gastroscope than with other methods now employed.

DISCUSSION

DR. WALTER L. PALMER, Chicago: I am sure that the method will give much more information about gastric disease. In the beginning I had some misgivings about it. Dr. Schindler has succeeded in examining every patient I have sent to him. Many patients quite willingly acquiesced to subsequent examinations for the purpose of studying the progress of the lesion.

DR. LEON SCHIFF, Cincinnati: I should like to ask Dr. Schindler whether he has ever observed a true jejunal ulcer through the gastroscope. This type of lesion is frequently difficult to demonstrate on roentgen examination. I should also like to know whether or not he has seen gastric ulcer in various phases of healing. Just what changes occur and how much time is required for complete healing to take place?

DR. J. A. EVANS, La Crosse, Wis.: Has the author been able to apply therapeutic measures through the gastroscope?

DR. RUDOLF SCHINDLER, Chicago: I have observed jejunal ulcers several times, but they are not found as frequently in stomachs that have been operated on as is a very severe gastritis. I have observed the healing ulcer very often. By examining these patients weekly with the gastroscope I have observed that generally in six and one-half to seven weeks the ulcer heals completely. It is not possible to give therapeusis through the flexible gastroscope, because it is filled with lenses.

The Formation and Fate of Derivatives of Bilirubin

DR. C. J. WATSON, Minneapolis: Information in this study was gained in several different experiments: 1. Feeding of a known amount of crystalline bilirubin by means of a duodenal tube to a patient with complete common duct obstruction (neoplasm). Results: (*a*) There was no evidence for bilirubin absorption from the bowel. (*b*) The majority of the urobilinogen formed was reabsorbed and not accounted for in the feces or urine, with an accurate quantitative method. 2. Comparison of urobilinogen excretion in the urine with that in the feces in cases of advanced liver disease. In several of these, the amount in the urine was from two to four times that in the feces, this bearing out the evidence obtained in the first experiment as to urobilinogen reabsorption. 3. Study of feces obtained from an ileostomy. Evidence for the formation of mesobilirubin in the transition of bilirubin to urobilinogen. 4. Study of the relationship of oxidation products of urobilinogen, evidence indicating that mesobiliviolin on further oxidation gives copronigrin. Appearance of mesobiliviolin absorption after melting of a crystalline iron chloride molecular compound of urobilin; this indicates a close chemical relationship between urobilin and mesobiliviolin.

DISCUSSION

DR. M. A. BLANKENHORN, Cleveland: I hope that some of the difficulties of making quantitative studies in biliary pigment is appreciated. Dr. Watson has made progress. I wonder whether he has taken into consideration, when he has given 10 mg. of bilirubin to a patient with common duct obstruction, the bacterial flora necessary to transform bilirubin into the preparation that is recognized as urobilinogen. In my hands,

attempting with the aid of a chemist intra vitro transformation of these chemicals, we found that a very careful bacterial arrangement has to be set up in which the type of organism is important. With the aid of Dr. Ecke, our bacteriologist, we found it was almost impossible to set up bacterial flora from pure strains. I should like to ask how long the patient has had his intestinal acholia. If he has had it a long time I would expect him to be no longer capable of transforming urobilinogen. I think that the finding of large amounts of altered pigment is emphasized by the conditions found in human gallbladder bile. Human gallbladder bile removed at autopsy will almost always contain large amounts of a substance that can be identified as urobilinogen or urobilin. In some instances it exceeds, gram for gram, the amount of bilirubin. I have been concerned in the last few years with the ratio of urobilin and bilirubin collected from the gallbladder. This ratio is quite variable. It suggests variables in absorption as well as variables in the ability of the liver to excrete the substance.

DR. C. J. WATSON, Minneapolis: In answer to Dr. Blankenhorn's question, the jaundice in both of these instances was of fairly long duration, in one about two months and the other three months, and presumably quite complete for most of that period. In both, the jaundice was due to neoplastic obstruction of the common duct. It is realized that these patients are not normal and that the bacterial flora may be altered. The stools in these instances were carefully examined for their bilirubin derivatives and it was possible to obtain crystalline stercobilin after the administration of bilirubin. It was not possible prior to the period of the experiment to isolate any derivative of bilirubin. Following the feeding of bilirubin the amount in the serum did not increase, to indicate that there had been any resorption of bilirubin itself. This experiment should be repeated a number of times before one can say that no bilirubin is resorbed. I think that the existing evidence, to which Dr. Blankenhorn's work certainly contributes a great deal, is in favor of the fact that there is no resorption of any appreciable amount of bilirubin from the bowel.

The Vascular Response to Venesection, with Observations on So-Called Bloodless Venesection

DRS. WILLIAM A. BRAMS and J. S. GOLDEN, Chicago: Patients with congestive failure were used in the experiments. Venous pressure was determined by a modified Moritz-Tabora apparatus. Readings were taken every five minutes for one hour after venesection. The blood pressure and pulse rate were determined at similar intervals. Bloodless venesection was accomplished by constricting three extremities to obstruct venous return, but not arterial. The same observations were made as with blood letting. Bloodless venesection showed little effect on venous pressure, blood pressure or pulse rate. Blood letting up to 800 cc. showed little effect on blood pressure or pulse rate. Venous pressure fell rapidly, to return in part after from twenty to thirty minutes. The best results were seen in previous high venous pressure.

DISCUSSION

DR. SAMUEL B. GRANT, St. Louis: About ten years ago I did some arterial punctures in patients with congestive heart failure to study the oxygen saturation of arterial blood. I found after venesection that they consistently showed an increase in the oxygen saturation of the arterial blood, which is another factor not absolutely proved.

DR. W. S. MIDDLETON, Madison, Wis.: There are three points that should be emphasized: First, the advisability of the indirect method in patients whose vascular status must be borne in mind; in other words, one has not made repeated punctures but has tried to maintain a blood way through the apparatus in the case of the Moritz-Tabora closed method. The ability to duplicate results by the indirect method in repeated observations should be brought out. The second point relates to the application of venesection; as the authors state, it should be utilized in the case showing venous hypertension and not arterial hypertension. This is the pathologic physiologic situation to be treated. Third, I think the speed of withdrawal is an important factor. One should try to do one's blood letting within five minutes. If it takes fifteen minutes to release the load on the right side of the heart, I think too much time has been expended to effect maximum benefit. The work of Eyster and Meek at Madison showed that the blood volume must be reduced to a given degree to decrease the size of the heart. Practically, if one is after this physiologic end one will withdraw enough blood, or at least 500 cc. for a person weighing 150 pounds (68 Kg.).

DR. J. S. GOLDEN, Chicago: The puncture need not be repeated if the needle is allowed to remain in the vein and one assures oneself that no blood is allowed to stay in the needle. There were no multiple punctures in these cases. We found that, when a quantity of blood was removed in a very short period, the venous pressure did drop very rapidly. Immediately after completion of the venesection there was a rise to a secondary level, from which the total level was approached. When we took a longer time the drop was more gradual, but there was no rapid return to the secondary level.

Blood Cyanates in the Treatment of Hypertension

DR. M. HERBERT BARKER, Chicago: The blood level of cyanates and the urinary clearance has been studied in relation to the dosage of potassium and sodium thiocyanate in patients with hypertension. A great variation in clearance and in the blood cyanate level is noted in each case on a given dosage. In general, blood pressure reductions have been observed in all the cases studied. A significant decrease in blood pressure level together with symptomatic relief has been quite regularly noted in the cases in which the dosage was gaged by the blood cyanate level. The optimum level for the blood cyanates to effect a pressure reduction seems to be 10 to 15 mg. Toxic manifestations and vascular collapse have occurred around 50 mg.

DISCUSSION

DR. EDGAR V. ALLEN, Rochester, Minn.: Will Dr. Barker say a few words about the mechanism by which the cyanates reduce the blood pressure?

DR. J. W. SCOTT, Lexington, Ky.: I should like to ask about the measurement of the level of cyanate in the blood.

DR. W. B. KOUNTZ, St. Louis: There has been so much criticism on the use of cyanate in hypertension that I am glad to hear a paper that says it has value. I have used it in a large number of cases of hypertension and a satisfactory response has been shown in a great many. I have not used the size dosage that Dr. Barker has and have not seen any toxic manifestations but have kept the dose well down. The routine has been to give it in courses of two weeks on and two weeks off. A reduction in the blood pressure has been noted.

DR. M. HERBERT BARKER, Chicago: I do not know about the action of the cyanates. So far as I know, no work has been done to prove their action. The general attitude has been that it produces muscular weakness. All of the patients complained of fatigue. In this period of readjustment, patients may complain of weakness and feeling "as though they would like to hold their own eyelids open." Their legs may be so tired that they can hardly carry themselves around. That wears off and their full energy returns and they feel stronger than ever. So I do not feel that the muscle tone is the whole answer. It is not true of the muscle tone in the vascular tree, because these patients have not regained their strength if blood pressure is an index. An attempt has been made to show the good effect to be on the nerve structure or on the suprarenals but this has not been satisfactory to date. The method of determining the cyanates is very simple. When the cyanate is combined with iron it produces a tan or wine color, which is easily read in a colorimeter. Dr. Kountz's point is a good one. His experience has taught him to give cyanates on alternate weeks, which is one way of being cautious. Unless these patients are smokers, the salivary cyanate level is very low. There is virtue in the cyanates if used properly.

Coronary Thrombosis—A Follow-Up Study

DR. WARREN B. COOKSEY, Detroit: Fifty-three cases of coronary thrombosis seen in private practice since 1928 have been followed. Twenty-one of the patients, or 39.6 per cent, are dead, while thirty-two, or 61.4 per cent, are living. Of the patients who died, 71.5 per cent were above 60 years of age, with an average age of all patients who died of 63.4 years, while the average age of living patients is 54.2 years. In the living group, one patient is living at thirteen years, ten are

living at six years, two at five years, five at four years, five at three years, two at two years, and seven one year after typical severe coronary occlusions. Of the living patients, 78.1 per cent have been restored to their previous occupation. Recent electrocardiograms of the living group show evidence of coronary disease in 90 per cent. The most frequent observations are RT changes, 56.6 per cent; cove negative T_1 or T_2, 43.3 per cent; diphasic T_1 or T_2, 40 per cent, and a prominent Q_3, 16.6 per cent. These data justify a much more hopeful prognosis for all cases of coronary occlusion in which the first six months has been survived.

DISCUSSION

DR. W. B. KOUNTZ, St. Louis: Has Dr. Cooksey used any vasodilator following coronary thrombosis?

DR. L. N. KATZ, Chicago: Coronary thrombosis is not always an inevitably fatal disease. As methods of diagnosis improve, earlier and milder forms become recognized. This is the merit of the four lead electrocardiogram. I recently saw a patient at Michael Reese Hospital with a stab wound of the heart in whom the lower part of the left descending branch of the coronary artery was tied at operation. The patient developed a serial electrocardiographic picture of myocardial infarct without any clinical evidence. In fact, as soon as he left the hospital he began doing hard manual labor without ill effect. As knowledge of the disease develops it will be found that coronary thrombosis ranges from extremely severe forms to what might be termed subclinical varieties.

DR. F. N. WILSON, Ann Arbor, Mich.: I should like to make one or two remarks concerning the mortality in coronary occlusion. If one ties off a large coronary artery in a series of dogs, about half the animals die. The great majority of the deaths occur within the first twenty minutes and are due either to the onset of ventricular fibrillation or to contractile failure without any disturbance of the cardiac mechanism. I suspect that the majority of the patients who die as a result of coronary thrombosis are dead before the physician arrives. If death does not occur within the first half hour, the chances that the patient will survive are excellent.

DR. W. B. COOKSEY, Detroit: Concerning vasodilators, I take the attitude that one is struggling to maintain collateral circulation and that anything which will facilitate it is worth while. Whether anything is being accomplished by vasodilators I believe is hard to answer. In relieving angina pectoris they have certainly proved very satisfactory. I have used chiefly aminophylline, theobromine alkaloid or synthetic theophylline. Dr. Wilson's remarks are well taken. The mortality does vary. I would not say that, if I knew all the patients with whom I come in contact who later die of coronary occlusion, the mortality would be quite so good as it is. It depends on many factors. Much depends on the size of the vessel occluded, and it is of great importance what the patient does in the few days and weeks following the occlusion. One more interesting fact that perhaps I did not emphasize sufficiently, I believe that the older age group (60 to 70 year group) has less chance of surviving following a coronary occlusion than the younger group.

Clinical Study of Electrocardiograms in Pellagra

DR. HAROLD FEIL, Cleveland: These observations were made in thirty-eight cases of pellagra seen in the medical service at Lakeside Hospital. All cases were typical pictures of pellagra and alcoholic in origin with the exception of one boy, aged 15 years, whose diet had been inadequate. Electrocardiograms were made in all cases during the height of the disease and in most cases at weekly intervals during the convalescence. In twelve cases the phases of cardiac systole were studied by heart sounds and subclavian pulse records. In 60 per cent of the cases the electrocardiogram was normal. Of the remaining, there were the following abnormalities in the order of frequency: inversion of T_1 and T_2 or both, 16 per cent; Pardee T (13 per cent); inversion or eversion of ST, large T in at least one lead, and low voltage, 18 per cent. Electrical systole was slightly lengthened and likewise mechanical systole. The isometric phase was normal. The electrocardiograms in some instances returned to normal with recovery. Teleroentgenograms in several cases were normal. Pathologic study of the hearts coming to postmortem was normal. The electrocardiogram was abnormal in about one fourth of the cases of pellagra, and electrical and mechanical systole are prolonged in most cases, suggesting that the heart is affected.

Stimulants of Bone Marrow in Hog Gastric Contents

DR. JOHN H. FOULGER, Cincinnati: Chemical and clinical studies of concentrates of hog gastric contents, carried out in association with the late Prof. Roger S. Morris, show that, in addition to the hematopoietic agent which Morris termed addisin, there is present a distinct chemical substance which, on intramuscular administration to patients showing a neutropenia, can cause a marked and often prolonged increase in the granulocyte count. The response is most pronounced in patients who are either resistant to massive doses of pentnucleotides or who have received smaller doses of pentnucleotides than are usually of therapeutic value. A single injection of 180 mg. of a crude preparation of the granulocytopoietic substance of hog gastric contents has sufficed to produce a remission.

DISCUSSION

DR. FRANK J. HECK, Rochester, Minn.: I am very skeptical about the efficacy of any of the preparations on the market at present for treatment of granulocytopenia. No untreated control series has been run, so far as I know, by any of the men reporting excellent results with the various therapeutic measures now advocated. Granulocytopenia is merely a condition that occurs in any one of a considerable number of diseases. Proper classification as to etiology is important. I should like to ask Dr. Foulger whether there was any history of drug use in the cases he is reporting.

DR. RAPHAEL ISAACS, Ann Arbor, Mich.: I noticed that the total white count in some cases is about twice the total polymorphonuclears. I recall that the original work of Dr. Morris and his associates showed a neutrophilic increase. Since this substance was injected into the muscle, it could have acted on the muscle and produced a new substance, similar to that developed during gastric digestion. The eosinophilia is suggestive of this.

DR. C. A. DOAN, Columbus, Ohio: I would like to ask whether any animal experiments together with study of the tissues have been made.

DR. L. G. ZERFAS, Indianapolis: The injection of fresh human gastric juice intramuscularly into a patient with pernicious anemia in relapse is without hematopoietic effect. When the gastric juice is stored in the icebox for two months or incubated for four hours at 40 C., however, definite reticulocyte responses occur. An increase in white blood cells also takes place at the same time. The same is observed when potent hematopoietic substances are fed by mouth or when they are injected. Dr. Helmer, Dr. Fouts and I have felt that the general bone marrow stimulation observed as a result of the injections of incubated gastric juice was due to some protein breakdown or to an actual blood destruction process and not to a hormone in the gastric juice. We have had no other experience with the white blood cell stimulating effect reported by Dr. Foulger. The lack of knowledge concerning the physiology of the bone marrow makes it extremely difficult for us to explain many of the responses observed.

DR. JOHN H. FOULGER, Cincinnati: I agree with the remarks about the lack of control. Nothing is known about the physiology governing the output of cells by the bone marrow. Patients with an extremely low white count are usually extremely sick. The clinician in charge is anxious to do something. The real object is to save the patient. I doubt whether in this type of case one will ever have scientific control and whether any methods of stimulating bone marrow are curative. Sooner or later the bone marrow reaches a state such that it will not respond to any treatment. I am perfectly agreed on our ignorance of the cause of spontaneous remissions in these cases, but in testing many substances of this type it is necessary to accommodate oneself to the material available. With regard to the action on muscle tissue of such injections, I think that the preparations used in most cases have been fairly pure chemically, much purer than liver preparations. Some of the concentrates used in the treatment of these cases have not been irritating in any degree. The possibility of the presence of trichina must of course be thought of in all work with swine products. But the preparations used were filtered

and therefore could not have contained trichina. Coming back to the work reported by Dr. Morris and his associates, it has been claimed that all their results were obtained because the concentrates of gastric juice acted on muscle. These claims might, I suppose, be accepted in the absence of further knowledge. But the most active preparations of addisin were made by a method that seemed to me as a chemist to have excluded all enzymes. They were made by esterification and extraction with ether. I do not know of any enzyme that can be subjected to the process used, and then extracted with ether. Preparations made in this way were the most active we have obtained in the production of hematopoiesis. With regard to animal experimentation, experiments are being conducted at present on the effect of this particular concentrate of the white cell count.

The Influence of Gastric Lavage on Familial and Nonfamilial Erythremia

DRS. HARRY OERTING and JOHN F. BRIGGS, St. Paul: Following the suggestion of Morris that erythremia may be the result of hyperaddisinism, the influence of gastric lavage on the erythremic syndrome was observed in erythremia of the familial and nonfamilial types. Lavage was done in each case from four to six times daily and the time of lavage varied from day to day. In nonfamilial erythremia, lavage alleviated the clinical symptoms and there was a marked improvement in the blood picture. In familial erythremia, lavage relieved the symptoms and prevented the usual increase in the blood picture. The material obtained from the nonfamilial erythremia lavages was placed untreated in the stomachs of patients with primary anemia and was effective in producing remissions. Evidence indicates that primary anemia and erythremia are antagonistic phenomena and that they represent states of an addisinism and hyperaddisinism. It is also suggested that in familial erythremia alterations in hemolysis are the factors producing the syndrome.

DISCUSSION

DR. LEON SCHIFF, Cincinnati: Several years ago I noted a marked drop in the red cell count in a patient with polycythemia vera and duodenal ulcer who had been lavaging his stomach daily as part of a Sippy regimen. This observation suggested the possibility of an excess of hematopoietic factor in gastric juice as playing a rôle in polycythemia and led to the suggestion of gastric lavage as a therapeutic measure in this disease. Since then I have treated two cases of polycythemia vera with repeated gastric lavage. The gastric contents were aspirated two or three hours after each meal for a period of two months. The patients were on a low purine diet, and an attempt was made to decrease and neutralize their gastric secretion by the use of belladonna, bromides and alkalis. No effect was noted on either the symptoms or the blood count. The failure to obtain a response does not disprove the existence of an excess of "intrinsic" hematopoietic factor, as two months is a relatively short period, and at best only a fraction of total gastric juice secreted can be removed. It may require years for pernicious anemia to develop after total gastrectomy in spite of the established relationship of the stomach to hematopoiesis. As Dr. Briggs stated, the report of Wilkinson that an extract made from the liver in a case of polycythemia vera contained more antianemic substance than an extract obtained from normal liver is interesting and may have some bearing on this discussion.

DR. L. G. ZERFAS, Indianapolis: The observations reported by Wilkinson relative to the gastric juice may not bear any relationship to the etiology of polycythemia vera. The theory that polycythemia may be the result of a hypersecretion of the "intrinsic factor" in the gastric juice is intriguing. However, there is another point of view to consider which seems more plausible; namely, the relationship of anoxemia to the overproduction of red cells. It is common knowledge that there occurs in this disease extensive fibrosis and thickening of the walls of the arterial vessels. Dr. Reznikoff of New York has demonstrated the marked fibrosis of the bone marrow, which may in itself produce a sufficient degree of anoxemia in this tissue to cause an overproduction of red cells. Studies made at high altitude have already shown the relationship of the reduced oxygen supply to the increased number of red cells and hemoglobin in the peripheral circulation.

DR. W. B. COOKSEY, Detroit: About a year and a half ago when Dr. Morris first mentioned this possibility, I saw a case of polycythemia vera in which there was a count of eight million. At the same time I saw a case of aplastic anemia in which many kinds of treatment, including addisin, had been administered. The patient was a very intelligent man and wanted to take more addisin. As he was willing to pay for it, I trained my polycythemia vera patient to wash his stomach twice a day and deliver the contents to the other patient. This procedure was followed for four weeks with no benefit whatever to either patient.

DR. HOWARD L. ALT, Chicago: Were any determinations of the acid-base equilibrium made in these cases?

DR. S. M. GOLDHAMER, Ann Arbor, Mich.: If one follows over a period of months the red cell count in cases of polycythemia vera, there is often a variation of more than three million cells. In the figures on the board, there is a variation of half a million or a million red blood cells, which amount would fall within the limits of error. Furthermore, if a patient with polycythemia does get an excess of addisin, all the red blood cells developed should be adult rather than young cells. Also, it has never been shown that liver extract can be given to patients in sufficient amounts to produce a constant reticulocytosis which can be maintained over a period of years as one sees in cases of polycythemia. As to the protective mechanism, when one gives a patient an excess amount of the "unknown" substance, intramuscularly or intravenously, in a few hours one can find a large amount present in the urine. It seems to me that in these individuals with polycythemia the body would take care of any excess substance produced.

DR. RAPHAEL ISAACS, Ann Arbor, Mich.: I should like to suggest another interpretation of this material, which is that pernicious anemia and polycythemia are not opposites of each other. In pernicious anemia the factor that matures the red cells beyond the megaloblast stage is missing. Therefore the body tries to make red cells but can never mature them beyond that stage. The bone marrow is full of megaloblasts. If there was too much "maturing substance," the red cells would mature too fast. Instead of having too many red blood cells, the patient would have an aplastic anemia. He would mature all the cells and they would stop developing. Aplastic anemia is the opposite of pernicious anemia and not polycythemia.

DR. W. S. MIDDLETON, Madison, Wis.: The experience at the Wisconsin General Hospital might be of interest. After this intriguing concept of the Cincinnati group appeared, a patient with polycythemia vera came in with 9,000,000 red blood cells. Gastric lavage was instituted twice a day and there seemed to be a brilliant response, the red cells going down to 6,500,000. Apparently the lavage was kept up too long, for after six weeks the count went up to 9,000,000. I think this experience has been repeated by Farrar at Ann Arbor. We considered doing a partial gastrectomy if the remission in the blood picture was repeated after a period of rest and then renewal of gastric lavage.

DR. JOHN F. BRIGGS, St. Paul: No study has been made on the acid-base equilibrium following lavage. This patient was followed for two or three years with counts two or three times a week and there was no marked variation in these counts. During the time before gastric lavage was started the reticulocyte count was at its lowest. The second patient is responding to lavage. Apparently the secret of the response is frequent lavage with complete washing of the stomach. Unless 700 cc. of gastric juice is expressed daily, a drop in the blood picture is not obtained.

Clinical Study of Idiopathic Thrombosing Disease (Thrombophilia)

DRS. KAARE K. NYGAARD and GEORGE E. BROWN, Rochester, Minn.: A group of cases has been recognized and studied, in which there are episodes of thrombosis of the veins or of the arteries. Thrombosis in the vessels appears independent of intercurrent disease, specific infection or operation. There is no demonstrable primary disease of the wall of the blood vessel. The primary disturbance, in some of these cases at least, seems to be of hematogenous origin: changes in the coagulability of the blood plasma, increase in the number of platelets and (or)

changes in the normal albumin-globulin ratio of the serum proteins. These changes appear with remission of thrombosis. In diagnosis, there has been confusion with thrombo-angiitis obliterans. The group of cases considered represents, probably, a distinct clinical entity, which in the past has been designated idiopathic phlebitis or simple thrombosis of the vessels.

DISCUSSION

DR. C. A. MILLS, Cincinnati: I should like to know whether these patients were tried on a low protein diet therapy and, if so, what effect it had. There seemed to be quite a period in which the thrombosing condition existed.

DR. EDGAR V. ALLEN, Rochester, Minn.: The thesis of Drs. Nygaard and Brown is that there is a condition in which occlusion of arteries and veins is due solely or largely to intravascular coagulation resulting from an increased case of coagulation of the blood. This condition is different from the usual case of vascular thrombosis, in which the primary cause is in the wall of the vessels. Two questions are apparent. Why doesn't the thrombosis extend to involve the major portion of the blood vascular system, and why does it involve arteries chiefly when the slower flow in the veins is more conducive to thrombosis? A more logical explanation is that there is some localized vascular injury, which serves as a basis for thrombosis, which would not occur ordinarily. Support for the contention of the authors is offered by observations that the cases are bizarre ones clinically, that usual cases of chronic occlusive arterial disease do not show increased coagulation of the blood, and that microscopic examination of the involved vessels in the syndrome described by Drs. Nygaard and Brown does not show the usual inflammatory changes in the arteries and veins such as are seen in thrombo-angiitis obliterans, or the degenerative ones such as are seen in arteriosclerosis. The clinician is greatly aided by the observations made by Drs. Nygaard and Brown as they explain bizarre types of vascular disease not satisfactorily classified heretofore.

DR. J. W. MOORE, Louisville, Ky.: Has he had any instance of thrombosis in the pulmonary veins?

DR. KAARE K. NYGAARD, Rochester, Minn.: We have not made use of any diet or any kind of therapy in an effort to change the coagulability factor. We have tried dyes. So far as we could make out, they have been of no value in changing the coagulability. These patients had fever at the time. In the first case that I reported, a man, aged 27, had fever for two weeks and then a subnormal temperature for another week, and a low leukocytosis. In one of these cases it was found that there was a thrombus in the pulmonary vein. We went over the cases from 1924 but none of them had any pulmonary emboli, so I think the idea of the pathologist at the time was an occlusion in the pulmonary veins.

High External Temperatures, the Suprarenals, and Body Relaxation

DR. C. A. MILLS, Cincinnati: The heat of the past summer has brought out in striking fashion the physiologic effects of high external temperatures. Widespread declines in blood pressure levels have been noted in all types of patients, with the average being around 30 per cent. Normal pressures have declined below 100 and hypertensive cases have shown just as marked falls. These heat effects would seem to differentiate between the sclerotic and spasm factors in hypertension, for, when real sclerosis was present, the fall in pressure was halted above the normal level. Many cases of hypertension without evident sclerosis fell to within normal limits. This demonstration of natural heat effects, with the resulting evidences of body relaxation, clearly bears out what I have previously written as to climatic and weather stimulation, and the importance of this factor in metabolic and arteriosclerotic disturbances. Here lies the explanation of the marked differences between tropical regions of moist heat and temperate regions of great storminess in their relative severity and frequency of metabolic and degenerative diseases. Artificial moist heat might well be tried in northern winters in an attempt to mimic this relaxing effect of summer heat waves.

DISCUSSION

DR. E. P. MCCULLAGH, Cleveland: In consideration of the suprarenal glands and their relation to body temperature, it is interesting to reflect that in suprarenal apoplexy, as seen in children or occasionally following suprarenal operations, there is a very marked increase in body temperature as part of the clinical syndrome. There are two other striking features which accompany acute suprarenal insufficiency of this type; first, a peculiar sort of drowsiness, which gradually increases to coma but is quite distinct from the sort of mental change seen in Addison's disease, and, second, a rapid respiratory rate. I wonder whether these two phenomena associated with rapid failure of the suprarenal could be correlated in any way by Dr. Mills with the changes that he has been discussing.

DR. E. L. SEVRINGHAUS, Madison, Wis.: There are two things of interest in the presentation of Dr. Mills. One is that there is a well recognized critical level above or below which there is failure to get maximum vasodilatation. That critical level seems to be about the body temperature. On the basis of this fact I have been using controlled heat for vascular disease of peripheral type and from its use there is apparently better circulation in the extremities. The other point is that Dr. Mills suspects that there is decreased heat production with high environmental temperature. There is good evidence in human and animal work showing that there is also a critical minimum of heat production by the body, which is at about 30 to 32 C. As one goes to higher temperatures there is an increase in heat production. If the critical temperature level is exceeded, I wonder whether he has evidence of decreased production in hot weather.

DR. CLARENCE F. G. BROWN, Chicago: Until more is known about the quantitative clinical measurement of the suprarenal and its action, shouldn't one think of this as the direct action of an external stimulus on the vegetative nervous system itself? This can set in play all the visceral reflexes necessary to produce the results described so well by Dr. Mills. Similar clinical pictures have been produced by changes in intrapulmonic pressures both in the dog and in man.

DR. C. A. MILLS, Cincinnati: There is good evidence, I think, of an actual change in the level of heat production depending on the external temperature to which the individual or animal must accommodate itself. We did not go into this phase of animal adaptation at Cincinnati because of scarcity of funds for the purchase of metabolism apparatus. However, workers in Belgrade (S. Gelineo, Institut de physiologie général de l'Université de Belgrade) last spring sent me copies of recent papers of theirs in which were detailed the results of experiments covering this point. They found that animals adapted to a given temperature level showed a marked increase in heat production when the external temperature was lowered. Furthermore, the lower the temperature level to which the animal was adapted, the greater was the heat production increase when a further drop in temperature occurred. Animals adapted to 35 C., for instance, showed a much less marked increase in heat production when the environmental temperature was reduced 10 degrees C. than did those adapted to 25 C. The more active the metabolism of the animal, the greater seems to be his response to chilling, and the differences found are quite striking. This is what I felt sure was happening in the response of man and animals to drops in environmental temperature. I have had many scientists suggest that such response was mainly vasomotor, shifting the blood away from the cooled surfaces so as to maintain body temperature. Such vasomotor reactions I feel to be of minor importance in the body adaptation to chilling, changes in heat production playing a far more important rôle in this respect. I do not know just how the symptoms of suprarenal apoplexy would fit into the picture of adaptation as I have presented it. In some such cases the symptoms much resemble the exhaustion of heat prostration, which I have attributed to loss of function in the suprarenal cortex. Other cases are more like heat stroke, with a complete derangement in the temperature adaptive mechanism. So far as I know, the suprarenals cannot be entirely separated from the vegetative nervous system. The talk recently given by Dr. Dale at Indianapolis brought this fact out in striking fashion. The proof seems almost complete that epinephrine or a very similar substance is liberated by impulses arriving at the sympathetic nerve endings and that it is this chemical activator which transforms the nerve impulse into tissue stimulation. I have long felt that suprarenal activity played some

definite part in the tissue response to autonomic stimulation, and now Dr. Dale seems to have the detailed explanation of why this should be so. It is easily seen, then, how difficult it becomes to separate suprarenal function from that of the vegetative nervous system.

Involution of the Thyroid Under Prolonged Injections of Pituitary Thyrotropic Hormone

DR. PAUL STARR, HELEN PATTON and RICHARD BRUNER, Chicago: Following the work of Collip, Friedgood and others, the thyroid gland of the dog and guinea-pig have been studied during prolonged injections of a solution of sheep anterior pituitary gland substances. The initial hyperplasia gives way to involution during these injections. Histologically, the gland does not appear to be exhausted of secretion. [Photomicrographs of such glands were shown. The important problem of the mechanism of this involution, whether induced by action of some other hormone or simple recovery after neutralization of the injected material by an antibody, were discussed.]

DISCUSSION

DR. E. P. MCCULLAGH, Cleveland: Were the metabolic rates determined in these animals and, if so, did the levels following treatment fall to below normal? If it is true that by the Janssen method a preparation of thyrotropic hormone can be made that will be protein free, I wish to suggest that it might be possible to free such a hormone from protein substances sufficiently to prelude the possibility of immunity as the cause of antihormone effect.

DR. GEORGE M. CURTIS, Columbus, Ohio: Was any investigation made of the iodine content of the glands?

DR. E. L. SEVRINGHAUS, Madison, Wis.: I think that the authors would like to know that there is some analogous work on the ovary at Madison. Hisaw has been carrying out that work after the plan of Collip and has transferred a passive immunity to gonadotropic extracts to other animals. The authors have described the refractory period that comes after active stimulation as Hisaw found it in the ovary. This refractory period occurs after a few weeks of treatment but disappears after a few weeks' rest without continuous injections. These changes do not seem like immune reactions.

DR. PAUL STARR, Chicago: In answer to Dr. McCullagh, we are working on guinea-pigs and do not find subnormal rates in the involutional period. We have not made any iodine studies, although such have frequently been made abroad both on glands and on blood. The Janssen material, is an impure protein precipitate. I doubt whether one could use its supposed freedom from proteins as an argument against immune bodies. Dr. Collip reports that agglutinins cannot be obtained. It is interesting then that serum taken from these animals will inactive the original hormone.

Calorigenic Action of Extracts of Anterior Lobe of Pituitary

DR. W. O. THOMPSON, DR. S. G. TAYLOR III, DR. PHEBE K. THOMPSON and L. F. N. DICKIE, Chicago: The subcutaneous administration of extracts of the anterior lobe of the pituitary produced an increase in basal metabolism in twenty-four of thirty-nine patients of various types, including three with hypopituitarism, seven with nontoxic goiter, three with low basal metabolism of unknown cause, four with typical myxedema, nine with mild myxedema (three of these had a nontoxic goiter) and five with exophthalmic goiter. The increase in metabolism was only temporary in spite of prolonged administration of the extracts, the greatest length of time that the metabolism was affected being about two months. No increase in metabolism was observed in the patients with typical myxedema (more data are needed to establish this point), but a well marked increase occurred in the patients with mild myxedema. During the injections in the patients with exophthalmic goiter, mild cases of the disease became moderately severe ones. This increase in the severity of exophthalmic goiter naturally raises the question of the rôle of the pituitary in the disease.

DISCUSSION

DR. PAUL STARR, Chicago: Possibly the most valuable application of this material might turn out to be its use in the stimulation of large colloid goiters with depressed thyroid function. The physiologic work suggests that one may be actually producing in the patient an antimechanism, which in the end may increase the disturbance for which treatment was given.

DR. CECIL STRIKER, Cincinnati: I should like to ask whether, after the metabolism has dropped to normal and the thyroid is apparently exhausted, if one gives thyroid extract, the metabolism rises? If the thyroid is exhausted and one increases the pituitary, does one get another rise in the metabolism?

DR. W. O. THOMPSON, Chicago: We are not drawing conclusions from this work about the treatment or about the mechanism of production of exophthalmic goiter. We are merely presenting a few observations the precise nature of which still remains unsolved but which possibly can be explained on the basis of stimulation of the thyroid by the pituitary. I do not believe these extracts are suitable for routine clinical use at present because of their temporary action. It is possible that the active principle of the anterior lobe is linked to a complex molecule and that immunity to this complex substance results in the development of immunity to the active principle. If such a point of view should prove to be correct, isolation of the active principle may result in a substance that produces calorigenic action indefinitely.

Relation of Thyroxine to the Metabolism of Tissues

JAMES E. DAVIS, PH.D., and A. BAIRD HASTINGS, PH.D., Chicago: Experiments have shown that total thyroidectomy results in decreased metabolism of the excised striated muscle of mice. Conversely, the injection of thyroxine in mice with and without previous thyroidectomy increases the excised tissue metabolism. Attempts to demonstrate an increase in tissue metabolism by the addition of thyroxine to the excised tissue of mice in vitro have given negative results. It has been found, however, that by utilizing a technic for keeping the excised frog heart alive for several days a marked increase in the metabolism of the frog heart may be demonstrated fifteen hours after the addition of thyroxine to the nutrient fluids in vitro. This result has been confirmed on the heart of the limulus, with and without its ganglion.

DISCUSSION

DR. WALTER M. BOOTHBY, Rochester, Minn.: It is interesting that the latent period is the same in these experiments as it is in man.

DR. GEORGE M. CURTIS, Columbus, Ohio: As a corollary to this work, I should like to present results concerning the blood iodine after total thyroidectomy. It maintains a level of about one-third normal. The blood iodine has been separated into alcohol soluble and alcohol insoluble portions. Presumably the alcohol insoluble portion is the thyroid hormone. After total thyroidectomy, this portion, about two thirds of the blood iodine, falls out, and only about one third of the normal blood iodine content remains.

DR. A. BAIRD HASTINGS, Chicago: I should like to emphasize that this would not be a good way of assaying thyroxine, because it takes a large number of experiments and there is a good deal of scattering in the determinations. It is only by doing a large number and waiting quite a long time that we are able to show the effect of thyroxine on tissues in vitro.

Metabolic Studies in Osteoporosis

DRS. MILDRED ADAMS, WALTER M. BOOTHBY and ALBERT M. SNELL, Rochester, Minn.: A prolonged metabolic study was made on a patient with a senescent type of osteoporosis, to determine the ability of such a subject to absorb calcium and phosphorus. For about five months the patient was on a constant, weighed and analyzed diet, with the addition of known amounts of tribasic calcium phosphate or calcium lactate, with and without viosterol. During the control period the subject definitely lost calcium, although there was a slight, positive nitrogen balance. It was possible to prevent this loss of calcium with either calcium phosphate or calcium lactate, although, when given in equivalent amounts without viosterol, calcium lactate appeared to be more efficient. Viosterol increased the retention of calcium after feeding of calcium phosphate but had little influence on the retention after feeding of calcium lactate.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

4: 453-544 (Nov.) 1934

Etiology of Granulopenia (Agranulocytosis), with Particular Reference to Drugs Containing Benzene Ring. R. R. Kracke and F. P. Parker, Emory University, Ga.—p. 453.

Diagnostic Methods in Amebiasis: Relative Value of Stool Culture as Compared with Other Methods. C. J. Tripoli and M. Shushan, New Orleans.—p. 470.

Rapid Pigment Appearance in Ohio Red Bellied Dace as Test for Intermedin: Preliminary Report. A. M. Young, Cleveland.—p. 485.

*Endocarditis Caused by Diphtheroid Bacillus (Pleomorphic Streptococcus). A. G. Foord and W. J. Stone, Los Angeles.—p. 492.

Endocarditis Caused by Diphtheroid Bacillus (Pleomorphic Streptococcus).—Foord and Stone present a case of subacute bacterial endocarditis having a typical clinical course and showing typical postmortem observations. From the blood on four occasions during life and from the blood and heart valve after death a diphtheroid bacillus was recovered in pure culture. Smears and sections of the heart valve revealed large numbers of the same organism with no other organism present. The serum of the patient obtained after death agglutinated the organism in high dilution. On liquid mediums streptococcic forms were produced, but only bacillary forms were found on blood agar. The case well demonstrates that diphtheroid bacilli in blood culture may be of vital importance and are not always simple contaminants. The entire clinical and pathologic picture presented by this patient and the bacteriologic studies point strongly to the view that the organism obtained is only a stage in the life cycle of a green producing streptococcus. The authors suggest that all strains of diphtheroid bacilli obtained from human cases of infection be cultured on appropriate mediums in order to demonstrate their relation to streptococci.

American Journal of Diseases of Children, Chicago

48: 1183-1468 (Dec.) 1934

Treatment of Whooping Cough with Active Undenatured Antigen. Minnola Stallings, San Francisco, and Valerie C. Nichols, Berkeley, Calif.—p. 1183.

Blood Picture in Experimental Whooping Cough. I. Inaba and S. Inamori, Mukden, Manchuria.—p. 1193.

*Typhoid Paratyphoid Therapy in Idiopathic Epilepsy: Clinical and Experimental Study. L. Antell, New York.—p. 1201.

Iodine and Thyroid Hyperplasia: I. Iodine Content of Human Skimmed Milk from Goitrous and Nongoitrous Regions. R. G. Turner, assisted by Mina Z. Weeks, Detroit.—p. 1209.

Dental Decay as Indicator of Dietary Fault. N. P. Larsen, Martha R. Jones and G. P. Pritchard, Honolulu, H. I.—p. 1228.

External Dimensions of the New-Born. H. Bakwin and Ruth Morris Bakwin, New York.—p. 1234.

Anemia of Prematurity. H. W. Josephs, Baltimore.—p. 1237.

*Rickets: Control with Fifty Units (Steenbock) of Cod Liver Oil Vitamin D Concentrate in Milk. D. J. Barnes, Detroit.—p. 1258.

Phosphatase Studies: V. Serum Phosphatase as Criterion of Severity and Rate of Healing of Rickets. A. Bodansky and H. L. Jaffe, New York.—p. 1268.

Mumps Meningo-Encephalitis. J. C. Montgomery, Detroit.—p. 1279.

*Neutralizing Value of Various Substances Against Lethal Doses of (A) Stool Emulsions from Patients with Poliomyelitis and (B) Colon Paratyphoid Organisms. J. A. Toomey, Cleveland.—p. 1284.

Reflex Changes in Typhoid Fever. J. A. Toomey, Cleveland.—p. 1296.

Roentgen Examination of Pyloric Canal of Infants with Congenital Hypertrophic Pyloric Stenosis. T. Meuwissen and J. Slooff, Eindhoven, the Netherlands.—p. 1304.

Typhoid Paratyphoid Therapy in Idiopathic Epilepsy.—Antell treated six epileptic patients with intravenous injections of typhoid-paratyphoid vaccine as a means of producing fever. Of these, five were children and one was a young adult. The results in all the children thus far have been good. There were no recurrences of seizures after periods of from seven months to two years from the institution of treatment. The one failure was in the case of the young adult. The author states that the possible advantages of this method of treatment over that of the ketogenic diet would seem to be that it is shorter, simpler and easier to carry out. With the first patient, it was used in conjunction with the ketogenic diet. The seizures were stopped completely, whereas it was impossible to do this with the ketogenic diet alone. The technic employed and followed closely was that described by Sutton in the treatment of chorea minor. New York City Health Department typhoid-paratyphoid vaccine was given intravenously at the elbow if possible or, in rare instances, in the jugular vein.

Control of Rickets.—Barnes protected thirty-two normal infants against rickets from November or December to April on 50 units of vitamin D given as a concentrate in milk. Six infants entering the study with slight roentgenographic signs of rickets showed progressive improvement on 50 units of vitamin D in milk a day. Since the rachitic lesions were slight, the healing processes were not striking, but they were nevertheless definite when traced throughout the series of roentgenograms. In no case did the patient grow worse during the study. A control group of twenty-five infants without antirachitic treatment during the winter were examined roentgenologically in April. Fourteen, or 56 per cent of these, showed active rickets, the remainder being normal. It is shown that for comparison of the various forms of vitamin D the ratio 40:240 for the vitamin D of irradiated milk and the vitamin D of cod liver oil does not hold. When both are given in milk, the required units are approximately equal. Considering the relatively small number of infants, the error of biologic assay and the difficulty of quantitative clinical evaluation, it is not safe to say that one differs from the other. A standardized clinical procedure is necessary in order to make satisfactory quantitative comparisons of various antirachitic substances.

Neutralizing Value of Various Substances in Poliomyelitis.—The experiments of Toomey on guinea-pigs show that serum obtained from Rosenow as well as commercial serum manufactured according to his method contained neutralizing bodies against the toxic factors present in the stools and urines of patients with poliomyelitis. Normal horse serum was equally good when used as a neutralizing agent against the same toxic factors present in the stools of patients with poliomyelitis. Serum from patients convalescing from poliomyelitis when injected intraperitoneally into guinea-pigs prolonged the life of the animals if they subsequently received injections of suspensions of coli paratyphoid organisms. In the dosage used, it did not prevent the ultimate death of the animal. The pathologic reaction of the cord was the same after injections of coli paratyphoid organisms as it was after injections of infantile paralysis stool emulsions. The spleen, and not the suprarenals, was the organ most involved after injections of coli paratyphoid organisms. Horse serum when injected intraperitoneally into guinea-pigs prolonged the lives of the animals that later received injections of lethal doses of coli paratyphoid suspensions. Unlike the animals which received injections of stool emulsions from patients with poliomyelitis, the pathologic reaction was most obvious in the spleen.

American Journal of Orthopsychiatry, Menasha, Wis.

4: 433-532 (Oct.) 1934

Evaluation of Statistical and Analytic Methods in Psychiatry and Psychology. F. Alexander, Chicago.—p. 433.

Autosuggested Dreams as Factor in Therapy. I. S. Wile, New York.—p. 449.

Therapeutic Results with Mentally Retarded Children. Leona Chidester, Topeka, Kan.—p. 464.

Study of Prepsychotic Personality in Certain Psychoses. K. M. Bowman, Boston.—p. 473.

Behavior of Encephalitic Children. R. L. Jenkins and L. Ackerson, Chicago.—p. 499.

Social Transformation of a Boy Who Had Lived His First Fourteen Years as a Girl: Case History. Grace H. Dicks, Cleveland, and A. T. Childers, Cincinnati.—p. 508.

Value of Explicit Acknowledgment of Transference. Temple Burling, Chicago.—p. 518.

Anatomic Basis of Lateral Dominance Anomalies. T. H. Eames, West Somerville, Mass.—p. 524.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

32: 575-716 (Nov.) 1934

Some Reflections on the Digestive Process: Caldwell Lecture, 1934. W. B. Cannon, Boston.—p. 575.
*Roentgenologic Study of Tuberculosis of Larynx and Neck. H. K. Taylor and L. Nathanson, New York.—p. 589.
*Varix of Pulmonary Vein. B. H. Neiman, Chicago.—p. 608.
Fibrin Bodies in the Pleural Cavity: Report of Three Cases. A. Shamaskin and J. Rogoff, Bedford Hills, N. Y.—p. 613.
Prognosis of Fractures of Vertebrae. E. W. Hall, Detroit.—p. 617.
*Multiple Spontaneous Idiopathic Symmetrical Fractures. L. A. Milkman, Scranton, Pa.—p. 622.
Primary Rectal Carcinoma Under Radiation Treatment: Statistical Review of Five Hundred Cases. H. H. Bowing and R. E. Fricke, Rochester, Minn.—p. 635.
*Radiation Treatment of Carcinoma of the Cervix. W. P. Healy and A. N. Arneson, New York.—p. 646.
Heublein's Method of Continuous Irradiation of Entire Body for Generalized Neoplasms. L. F. Craver and W. S. MacComb, New York.—p. 654.
Auditory Effects of Roentgen Rays in Dogs: II. E. Girden and E. Culler, Urbana, Ill.—p. 675.
Legal Aspect of Identification and Interpretation of Roentgenograms. I. S. Trostler, Chicago.—p. 680.

Roentgenologic Study of Tuberculosis of Larynx.—Taylor and Nathanson believe that laryngeal tuberculosis is a frequent concomitant of the malignant type of pulmonary tuberculosis and that it occurs often enough to warrant routine roentgen studies of the neck, in view of their diagnostic value. They obtain a sagittal view and can therefore gage the height and width of the lesion as well as the presence of a subglottic extension. Small intraventricular lesions, which may be missed on mirror examination, are demonstrable on the roentgenogram. Small lesions situated deep in the interarytenoid area are not detected on the roentgenogram. Roentgen examination gives a permanent pictorial record of the location, extent and progress of the lesion. It is essential to have at least two roentgenograms of the larynx—one taken at rest and the other during phonation in addition to the roentgenoscopic study.

Varix of Pulmonary Vein.—Neiman reports a case of varix of the pulmonary vein. The patient entered the hospital because of a sudden paralysis of the left arm and left leg. Clinically the signs and symptoms pointed toward an intrapulmonary lesion (cyanosis with some difficulty in breathing). The roentgen examination of the chest revealed a well circumscribed lobulated tumor-like shadow of even density occupying the upper lobe of the left lung. This shadow fused with the heart and diaphragm in the postero-anterior view of the chest. Roentgenoscopically it was possible to separate this tumor from the heart shadow and to show that it had no relation to the ascending aorta. These, with the conditions found on clinical examination and the fact that comparison with a roentgenogram taken three years ago showed no change in size or shape, suggested a benign tumor of the lung. The mass was too well circumscribed and of too long duration to be a primary carcinoma of the lung. It was not in the mediastinum at roentgenoscopy; therefore a mediastinal tumor could be excluded. Since the shadow that the pulmonary varix casts on the roentgenogram is sharply circumscribed in character, it serves to distinguish it from conditions that are of an inflammatory genesis. Tuberculous lesions and abscesses may be distinguished from this condition because of the presence of the irregular peripheral inflammatory infiltrations in the former. The two conditions that resemble pulmonary varices are chondroma and solitary echinococcus cyst of the lung. However, since echinococcus cysts and chondromas are the most common benign tumors of the lung, the problem of diagnosis would rest in differentiating these conditions from pulmonary varix. As regards the periphery, the pulmonary varices are invariably nodular. The chondromas are similarly nodular, even though these irregularities may be slight, while the echinococcus cyst is either perfectly smooth or presents slight inflammatory infiltrations in the immediately adjacent lung tissue. Frequently present in chondromas is the patchy, irregular distribution of lime salts, due either to simple calcification of the cartilage matrix or to true ossification. Calcification of the laminated chitinous lining membrane of the echinococcus cyst is occasionally present but is a more uniform process. In pulmonary varices it has been observed in small amounts. If the nodular periphery is present on the roentgenogram together with symptoms of cyanosis, dyspnea, cough, clubbing of the fingers or toes and intermittent hemoptyses, with an absence of serologic and clinical evidence of echinococcus infestation, one should think of a pulmonary varix.

Multiple Spontaneous Idiopathic Symmetrical Fractures.—Milkman describes a skeletal disease that is progressive, fails to respond to medication and may end fatally. He presents a case history, with reports of serial roentgen examinations over a period of eight years with postmortem observations. The characteristics of the disease are the disturbance in gait, pains in the back and peculiar multiple symmetrical involvement of the skeleton. The characteristic roentgenographic appearance is bands or zones of increased transparency seen throughout the involved bones of the skeleton. They are multiple and symmetrical. In the author's case, forty-three fractures occurred. A differential diagnosis may be made between this disease, late rickets, osteomalacia and fragilitas ossium. Pathologists differing in their interpretation of the microscopic appearance show the limitation of bone pathology in its ability to differentiate obscure osseous changes. The parathyroids are not involved so far as pathologic study is able to determine. The etiology is unknown. The postmortem observations of increased vascularity at the transparent zones suggest some trophic disturbance. The author states that, while it may be a worthy aim on the part of the pathologist to try to unite diseases of the bone into certain distinct groups, as von Recklinghausen, Looser, Schmidt and Wilton, the scientific attitude is first to separate the different entities into definite, distinct, individual diseases before grouping them under one disease entity.

Radiation Treatment of Carcinoma of the Cervix.—Healy and Arneson changed their usual plan of external irradiation with x-rays in twenty-five cases of squamous epidermoid cancer and one case of adenocarcinoma (all involving the cervix) in order to increase the amount of effective radiation given to the pelvic field adjoining the cervix, with the thought of controlling the disease in advanced cases for a longer period and possibly thereby to increase the proportion of permanent cures in such cases. The dosage delivered was 200 roentgens to each of two pelvic fields daily for a total of from 2,000 to 2,400 roentgens, without severe local or constitutional reactions. Clinical and histologic evidence of regression of the cancer in the cervix indicated that regression might also be reasonably expected in the disease in the parametrium for this amount of external roentgen irradiation. It would seem possible through these observations to plan a roentgen pelvic cycle that will deliver a tissue dosage adequate for control of cancer in the parametrium and outlying pelvic field without severe damage to normal structures. The authors believe that the opportunity offered to observe the coincident changes in the primary lesion may be utilized to advantage to follow the effects taking place in the parametria. Radium, however, should always be used for treatment of the primary lesion. In the earliest cases, with a small lesion limited to the cervix and without gross enlargement of the cervix, the radium treatment should be carried out before the roentgen cycle is given.

American Journal of Tropical Medicine, Baltimore

14: 497-592 (Nov.) 1934

Natural and Experimental Infection of Triatoma Protracta Uhler and Mammals in California with American Human Trypanosomiasis. F. D. Wood, San Francisco.—p. 497.
*Protective Power of Yellow Fever Serums and Dengue Serums Against Yellow Fever Virus. E. P. Snijders, S. Postmus and W. Schüffner, Amsterdam, the Netherlands.—p. 519.
Laboratory Infections with Virus of Rift Valley Fever. S. F. Kitchen, New York.—p. 547.
Direct Development of Hookworms After Oral Infection. A. O. Foster and S. X. Cross, Baltimore.—p. 565.
Dextrose Tolerance Test in Leprosy. D. G. Lai, Shanghai, China.—p. 575.

Protective Power of Yellow Fever and Dengue Serums Against Yellow Fever Virus.—Snijders and his associates discuss the hypothesis that under special conditions dengue might provoke a certain immunity to yellow fever. A more sensitive adjustment was devised in Theiler's as well as in Sawyer's mouse protection test in order to avoid the risk of missing moderate and lower degrees of immunity. The modifications applied to the technic are described. As a control for the technic, five serums of former yellow fever patients were

examined. By Theiler's method a distinct protection could be demonstrated in all cases; by Sawyer's method protection was evident in three cases. The examination of the serums of five assistants working more or less regularly in the yellow fever laboratory revealed a weak protective action in two of them, both by Theiler's method and by the modification of Sawyer's test. Considering that these two persons came into the most intimate contact with the yellow fever material, it is believed that they must have had mild (abortive) attacks of yellow fever at some time in the past. The serums of twenty volunteers, who had been experimentally inoculated with virus of Sumatran and Javanese dengue, were tested by both methods; in several instances the tests were repeated. Despite the sensitive adjustment of the tests, a protective action against yellow fever virus could not be demonstrated. A comparison of the immunity in dengue and in yellow fever indicates that in dengue the immunity shows considerable individual variation with regard to intensity and duration, and specific antibodies cannot be demonstrated in the serum. In yellow fever the immunity is almost absolute and antibodies are almost always present in the serum in high concentration.

Annals of Medical History, New York

6: 475-568 (Nov.) 1934

Sir Francis Seymour Haden. Estelle C. Bick, New York.—p. 475.
Sinhalese and South Indian Ceremonials in Prevention and Treatment of Disease. C. A. Wood, Chicago.—p. 483.
Baron Shibasaburo Kitasato. H. Fox, Philadelphia.—p. 491.
History of Stomach Tube. R. H. Major, Kansas City, Mo.—p. 500.
Rejuvenations and Satyricons of Yesterday. P. S. Codellas, San Francisco.—p. 510.
Aesculapius Among the Augustans. Minna Lewinson, New York.—p. 521.
Medicine Among the Iroquois. E. Stone, Providence, R. I.—p. 529.
Tuberculosis and Genius: Robert Louis Stevenson. L. J. Moorman, Oklahoma City.—p. 540.

Annals of Surgery, Philadelphia

100: 1043-1212 (Dec.) 1934

Results of Operations on Painful Hips. W. R. Bristow, London, England.—p. 1043.
*Anterothoracic Esophagoplasty for Impermeable Stricture of the Esophagus. A. Ochsner and N. Owens, New Orleans.—p. 1055.
Treatment of Empyema. J. F. Connors, New York.—p. 1092.
*Observation on Chronic Empyema. W. Martin, New York.—p. 1096.
Putrid Empyema: Ruptured Putrid Abscess of Lung. H. Neuhof, New York, and S. Hirshfeld, Los Angeles.—p. 1105.
Diverticula of Small Bowel. F. W. Rankin, Lexington, Ky., and W. J. Martin Jr., Louisville, Ky.—p. 1123.
Polycystic Disease of Kidney. G. D. Oppenheimer, New York.—p. 1136.
*Postoperative Wound Complications. E. L. Eliason and C. McLaughlin, Philadelphia.—p. 1159.
*Abdominal Wall Defects Following Appendicectomy. G. A. Carlucci, New York.—p. 1177.

Esophagoplasty for Stricture of the Esophagus.—Ochsner and Owens feel that anterothoracic esophagoplasty should be used only in cases of absolutely impermeable benign stricture of the esophagus or in cases of carcinoma in which the tumor has been extirpated. The best results have been obtained in those cases in which the operation has been accomplished by using a segment of colon and those in which a newly formed esophagus has been constructed out of a loop of jejunum and a skin tube. In mobilizing a jejunal loop the attempt should never be made to secure a loop of such length that the blood supply of the intestine will be in jeopardy. This has been responsible for the high incidence of failure and fatalities in the jejuno-esophagoplasties in which an attempt was made to form the esophagus entirely from the jejunum. The first stage of the jejunodermato-esophagoplasty should consist of the mobilization of the jejunal segment. This should be brought up through the lesser sac, completely mobilized, and the distal end anastomosed to the stomach, care being taken not to have a dependent loop. The proximal end should be brought up through a skin tunnel anterior to the thorax. The upper end of the jejunum, which is brought out through a small transverse incision, is sutured to the skin edges without the intestine being opened. The second stage should consist of the formation of the skin tube and the immediate completion of the junction between the skin tube and the jejunum. This is accomplished by extending the lateral incision for the formation of the skin tube down and round the jejunal opening. In this way a flap is produced which can be mobilized upward to be anastomosed to the skin tube, covering over the opening of the jejunum. Following this, the newly formed skin tube, the anastomotic site and the defects produced by the mobilization of flaps are covered by mobilizing skin flaps on either side. Relaxing incisions are necessary. Sufficient time is allowed to elapse between completion of this stage and the third stage of the esophagoplasty for the wound to heal completely. As a third stage the cervical esophagus is mobilized after a curved incision has been made, the incision passing along the anterior border of the sternocleidomastoid to a point just above the clavicle and then coursing laterally. The esophagus is mobilized well into the mediastinum. The upper end of the previously formed skin tube is freshened by a transverse incision, and the skin forming the lining of the tube is separated from the skin covering it. The esophagus is mobilized well down into the mediastinum, doubly clamped by means of right-angled clamps and divided transversely. The lower end is closed blindly by means of inverting sutures. The upper end is brought up into the wound and the distal segment of the upper end is invaginated into the upper end of the skin tube. The suture of the esophagus with the skin tube is accomplished by interrupted sutures passing through the subcutaneous tissue of the skin tube and barely catching the wall of the esophagus, care being taken not to penetrate into the lumen of the esophagus or to pass through the epidermis of the skin tube. In this way salivary secretions are discharged into the lumen of the skin tube without any danger of their coming in contact with the suture line. The skin flap is then replaced over the suture line, after a drain has been placed in the mediastinum. Because of the possibility of mouth contamination, Vincent's infection should be looked for, and, even if it is not found, it seems advisable to give neoarsphenamine as a prophylactic procedure.

Chronic Empyema.—Martin believes that the cause of chronic pyogenic empyema lies in the reaction of the tissue to repeated slight infection of the pleura; that such infection can be avoided by careful supervision of the treatment of the empyema cavity during the subacute stage; that a secondary operation with the removal of rib, and free drainage, will prevent extensive later operations; that when chronic empyema has developed surgical measures result in the starting of healing and the gradual obliteration of the cavity by making to some extent the rigid walls yielding, and finally that the residual thickened pleura resolves and becomes thin when the cavity is obliterated.

Postoperative Wound Complications.—In 9,155 general surgical procedures Eliason and McLaughlin observed 351 imperfect wounds, an incidence of 3.81 per cent. Reduction of the amount of catgut under the subcutaneous tissue has been the most important factor in reducing the incidence of serum collections. Contamination of the wound by infectious material handled at operation is one of the most frequent causes of superficial wound infection. Drainage of the superficial layers of all wounds in which soiled material is handled will materially reduce the incidence of wound infections that do not interfere materially with convalescence. "Wide open" drainage with adequate separation of the wound edges is the most logical and satisfactory method of handling a wound infection. No effort should be made to close amputation stumps following operations for infected diabetic gangrene in which pretibial edema, extending halfway to the knee, is demonstrable. A definitely stormy postoperative course usually precedes the development of a wound rupture. This was true in 88 per cent. Wound disruption is usually observed between the fifth and eighth postoperative days, 80 per cent being diagnosed during this period. The treatment of ruptured wounds with packing and adhesive straps is the safest method for the patient. Peritonitis is the most common cause of death following wound disruption.

Abdominal Wall Defects Following Appendicectomy.—In 700 cases of appendicitis operated on through an incision in the right lower quadrant of the abdomen, Carlucci found that eighty-three, or about 12 per cent, had some postoperative abdominal wall defect. These ranged from a simple weakness to hernias involving the whole length of the incision. The value of accurate and repeated follow-up examinations is defi-

nitely brought out by a study of this type. It is well demonstrated that cases in which the operation has been performed through a split rectus incision are followed by approximately twice as many defects as the intramuscular ones. It is also proved that the defects are about double in men as compared to women. Respiratory complications following the operation apparently have no bearing on the development of these weaknesses. In cases of appendical abscess in which the abdominal wall was not sutured or was only loosely approximated, many incisional hernias followed. On the other hand, fecal fistulas alone did not seem to produce any defect. Pregnancy and parturition even in cases in which drainage has been done apparently did not cause the incision to give way. That weaknesses and even hernias disappear as time goes on was well brought out. The records also proved that hernias could develop suddenly a year or more after the original operation. Only thirty-two were classified as incisional hernias. It is the author's impression, however, that a fair number classified as bulges are hernias with a large opening. In conjunction with this thought there is the possibility also that some of the bulges may be incomplete disruptions of the wound; that is, the external oblique fascia or anterior sheath has held, but the peritoneum and the overlying muscle have given way. To clear up this point it seems that more care should be given to the description of the pathologic changes found at operation when these defects are repaired.

Archives of Ophthalmology, Chicago

12: 805-1002 (Dec.) 1934

Lectures on Motor Anomalies of the Eyes: I. Physiologic Introduction. A. Bielschowsky, Breslau, Germany.—p. 805.
Rôle of Gonococcus in Purulent Ophthalmia in Warm Climates. A. F. MacCallan, London, England.—p. 819.
Surface Anesthesia in Ophthalmology: Comparison of Some Drugs Used. J. G. Bellows, Chicago.—p. 824.
*Action of Epinephrine on Normal Human Eye: Use of Stronger Solutions for Instillation. S. C. Howell, Atlanta, Ga.—p. 833.
Detachment of Retina: Treatment with Electrolysis Needle. A. Vogt, Zurich, Switzerland.—p. 842.
Orthoptic and Surgical Management of Strabismus: Report of Sixty Cases. J. P. Lordan, Los Angeles.—p. 843.
Adenocarcinoma of Meibomian Gland. A. Hagedoorn, Amsterdam, the Netherlands.—p. 850.
Method for Study of Retinal Circulation. R. K. Lambert, New York.—p. 868.
A Family of Squinters. F. H. Rodin, San Francisco.—p. 874.
*Unilateral Ophthalmoplegia Totalis: Parasellar Osteochondroma: Report of Case. J. M. Levitt, Brooklyn.—p. 877.
Practical Details in Orthoptic Treatment of Strabismus. G. P. Guibor, Chicago.—p. 887.
Pellagra as Cause of Optic Neuritis: Report of Case. J. Levine, New York.—p. 902.

Action of Epinephrine on Normal Eye.—Howell states that the instillation of a 2 per cent solution of epinephrine into the conjunctival sac of the normal eye is usually, though not always, followed by a reduction in the intra-ocular tension. The drop in pressure may occur within one hour, but in most cases it is not obtained until later. A similar lowering of tension, though of much less degree, may be seen in the opposite eye. Mydriasis usually occurs within one hour and disappears within twenty-four hours. Following dilatation of the pupil of the normal eye, there is no tendency toward a sustained or material increase in the intra-ocular tension. Absorption of epinephrine from the ocular conjunctiva may produce systemic effects in susceptible persons. Solutions of epinephrine, since they do not produce an increase in intra-ocular tension, are a suitable mydriatic for use in studies of the fundus and media of eyes in which atropine or its derivatives might be dangerous.

Unilateral Ophthalmoplegia Totalis.—Levitt reports the case of a woman, aged 20, who complained of left-sided headache and other symptoms referable to loss of motility and paralysis of accommodation of the left eye. Ocular examination revealed moderate ptosis, almost complete ophthalmoplegia totalis and slight exophthalmos of the left eye and a bilateral corneal hypesthesia. General physical and neurologic examinations and laboratory studies yielded negative results. Roentgenograms of the skull served to localize a calcified parasellar neoplasm on the left side. Operation disclosed a tumor at the junction of the left sphenoid ridge and the anterior clinoid process. Microscopic examination showed an osteochondroma with secondary changes. The tumor was probably derived from the sphenoid bone. The ocular changes were the result of compression of the trunks of the third, fourth, first division of the fifth and the sixth cranial nerves coursing in the left cavernous sinus. Two months after operation the upper lid of the left eye returned to a normal position, and the functions of the external and internal rectus muscles were partly restored. The case represents an early type of basal intracranial tumor and illustrates the clinical syndrome of the external wall of the cavernous sinus in a pure form without masking features.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

15: 641-704 (Nov.) 1934

Temperature Determinations During Local Application of Diathermy: Preliminary Report. W. Bierman, New York, and L. A. Tarbell, New Haven, Conn.—p. 645.
Newer Concepts in Colon Therapy. W. W. Worster, San Gabriel, Calif.—p. 650.
Physicochemical Basis of Physical Therapy. R. Beutner, Louisville, Ky.—p. 654.
Treatment of Bazin's Disease with Mercury Quartz Lamps. J. Echtman, New York.—p. 659.
Physical Therapeutic Measures in Sound Conduction Impairment. E. G. Linn, Des Moines, Iowa.—p. 663.
Rachitic Diathesis in Infant and Adult Life. G. J. Warnshuis, Milwaukee.—p. 668.
Occupational Therapy in Traumatic Conditions. Sue P. Hurt, New York.—p. 673.
Ultraviolet Rays in Vincent's Stomatitis. A. T. Rasmussen, La Crosse, Wis.—p. 676.
Tonic Effects of Combined Light and Air Baths. A. B. Olsen, Battle Creek, Mich.—p. 680.
Place of Physical Therapy in Organization of a General Hospital. R. Kovács, New York.—p. 685.

Archives of Surgery, Chicago

29: 895-1082 (Dec.) 1934

Factor of Spasm in Etiology of Peptic Ulcers. M. E. Steinberg and P. H. Starr, Portland, Ore.—p. 895.
Malignant Lymphoma of Gastro-Intestinal Tract. A. C. Pattison, Iowa City.—p. 907.
Spasm of the Orbicularis Oculi in Local Tetanus. K. P. A. Taylor, Havana, Cuba.—p. 923.
Undifferentiated Müllerian Duct in Man: Unusual Congenital Anomaly as Complication of Inguinal Hernia. J. H. Heyl, New York.—p. 929.
Anomalies of Intestinal Rotation as Cause of Intestinal Obstruction: Report of Two Personal Observations; Review of One Hundred and Three Reported Cases. C. E. Gardner Jr. and D. Hart, Durham, N. C.—p. 942.
General Sensations in Pedunculated Flaps of Skin. J. S. Davis and E. A. Kitlowski, Baltimore.—p. 982.
Gastric Acidity as Influenced by Pyloric Closure and Stenosis. R. Elman and C. T. Eckert, St. Louis.—p. 1001.
*Acute Pancreatitis. H. Koster and L. P. Kasman, Brooklyn.—p. 1014.
Cerebral Blood Flow: III and IV. C. Pilcher and C. Thuss, Nashville, Tenn.—p. 1024.
Absorption of Dextrose from Colon. W. W. Ebeling, Philadelphia.—p. 1039.
End Results of Operation on Thyroid Gland. C. O. Rice, Minneapolis.—p. 1047.
Influence of Exposure to Cold and of Deprivation of Food and Water on Development of Shock. A. Blalock, Nashville, Tenn.—p. 1055.
*Therapeutic Use of Concentrated Antistreptococcus Serum of New York State Department of Health in Cryptogenic Streptococcemia and Osteomyelitis of Children. Adele E. Sheplar, Martha Jane Spence and W. J. MacNeal, New York.—p. 1069.
Fifty-Fifth Report of Progress in Orthopedic Surgery. J. G. Kuhns, E. F. Cave, S. M. Roberts and J. S. Barr, Boston; J. A. Freiberg, Cincinnati; J. E. Milgram, New York, and R. I. Stirling, Edinburgh, Scotland.—p. 1076.

Acute Pancreatitis.—Koster and Kasman cite twenty-two cases of acute pancreatitis with a total mortality rate of 22.7 per cent. Seven of the cases presented the typical picture of a sudden onset of severe epigastric pain followed by continuous vomiting and associated with prostration and cyanosis. In two cases presenting a similar picture there was an indefinite previous history of a condition simulating gastric ulcer, which was diagnosed as such. In another case diagnosed as acute pancreatitis accompanied by obstruction of the common duct by calculi and cholangeitis of a duration of two weeks there was no shock or cyanosis, but the patient was deeply jaundiced. The remainder of the cases presented a less precipitous onset, which was suggestive of acute disease of the biliary tract. Attention is drawn to the fact that this last group of cases occurred most commonly in persons less than 36 years of age. It is suggested that in making the diagnosis acute pancreatitis should be suspected in every case presenting a history and symptomatology suggesting an acute exacerbation of disease of the biliary tract. Immediate and complete operation, which

includes cholecystectomy if the gallbladder is diseased or contains calculi, probing of the ducts to assure freedom from calculi or to allow for their recognition and removal, drainage of the biliary tract and examination of Wirsung's duct, in addition to treatment of the pancreatic lesion and the associated peritonitis, is advocated.

Therapeutic Use of Concentrated Antistreptococcus Serum.—Sheplar and her associates treated twenty-six patients with the special concentrated antistreptococcus serum of the laboratory of the New York State Department of Health. There were five patients with generalized or metastatic infection without a clinically recognizable port of entry. These patients were brought under observation in the hospital after invasion of the blood stream had taken place. It is uncertain whether the site of the initial invasion could or could not have been recognized at an earlier time. The ages of the patients ranged from 2 weeks to 5 years. In the first case the first dose of serum was administered two days after a blood culture was recognized as positive. This was on the day before death, at a time when meningitis must have already been present, according to necropsy. The second patient became ill with fever and the serum was administered ten days later when the blood culture taken two days before had shown positive growth. Necropsy revealed an acute vegetative mitral endocarditis with associated septic complications. In the fourth case the serum treatment was initiated eight days after the positive blood culture was taken and four days after the recognition of meningitis. In the third case, seven days after an operation for osteomyelitis the surgeon asked for the assistance of bacteriotherapy because of the impression that the disease was due to the staphylococcus. When the bacteriologic studies disclosed the true etiology, the streptococcus serum was administered in two days. There was a moderately severe serum rash four days later, but in other respects the behavior of the patient left little to be desired for nearly a month. The fifth patient had already suppressed the original invasion of the blood stream. The serum was employed as a safeguard against lighting up a streptococcic infection still persisting in the arm. The actual result was all that had been desired. Whether the patient would have done as well without the serum remains undetermined. In the authors' experience specific bacteriotherapeutic measures are most often instituted after too much delay. Their first, second and fourth cases represent examples. In the third case the earlier administration of the serum came about through a misapprehension. The bacteriologists were called in consultation in the hope of treating a staphylococcic infection with bacteriophage and, once this contact with the patient had been made, the early administration of streptococcus serum became possible. The authors conclude that, in vegetative endocarditis due to the hemolytic streptococcus and in meningitis coupled with bacteremia due to the same organism, the therapeutic use of antistreptococcus serum, in their hands, has not been successful.

Arkansas Medical Society Journal, Fort Smith

31: 109-126 (Dec.) 1934

Uterine Hemorrhage. I. F. Jones, Fort Smith.—p. 109.
*Agranulocytic Leukopenia, with Multiple Peripheral Neuritis. F. J. Scully, Hot Springs National Park.—p. 113.
Five Unusual Paralytic Cases Following Gastro-Intestinal Disturbances. W. B. Grayson and G. Hastings, Little Rock.—p. 114.

Agranulocytic Leukopenia with Multiple Peripheral Neuritis.—Scully reports a case of agranulocytic leukopenia in which multiple peripheral neuritis developed during the course of the disease. There was no history of the use of any barbiturate and amidopyrine preparations. Pentnucleotide was used in the treatment of the neutropenia because of the favorable results that had been reported by Jackson and his associates and because of the lower mortality rate that was noted by Doan in comparison with other methods of treatment. The case presented the typical appearance of an agranulocytic angina but was unusual because of the complicating multiple peripheral neuritis. The marked inflammation of the throat was evidently the source of the toxins that produced the neutropenia, while at the same time affecting the peripheral nerves. It is possible that, if the condition had been recognized earlier and treatment instituted at that time, the damage to the peripheral nerves might have been avoided.

Illinois Medical Journal, Chicago

66: 501-588 (Dec.) 1934

Diagnosis and Treatment of Infection of Urogenital Tract in Childhood. I. A. Abt, Chicago.—p. 521.
*Chronic Cicatrizing Enteritis, Regional Ileitis (Crohn). B. C. Cushway, Chicago.—p. 525.
Physiologic Effects of Vitamin Deficiencies as Summarized Briefly from Recent and Authenticated Research Experiments. Mildred Oncken, Chicago.—p. 533.
Allergic Diseases in Childhood. W. L. Crawford, Rockford.—p. 535.
Darkfield Diagnosis of Infectious Syphilis. H. E. McDaniels, Chicago.—p. 541.
Improperly Directed Birth Control Propaganda. Effie L. Lobdell, Chicago.—p. 545.
Radiation Therapy of Gas Bacillus Infection. J. J. Faust, Decatur.—p. 547.
Sanitation of the Country Home. R. Oden, Chicago.—p. 551.
Modern Conception of Cancer of Larynx. M. R. Guttman, Chicago.—p. 553.
Cardiac Functional Diagnosis. F. M. Meixner, Peoria.—p. 559.
Fetal Peritonitis in a Premature Infant: Operation and Recovery. G. L. Davenport and S. L. Goldberg, Chicago.—p. 563.
Folliculin Cyst of Ovary Presenting Symptoms of Pregnancy. W. W. Voigt, Chicago.—p. 565.
Cyst of the Epiglottis and Other Laryngeal Cysts. G. H. Woodruff, Joliet.—p. 569.
Hypertensive Heart Disease. R. S. Berghoff, Chicago.—p. 573.
Some Civil Legal Aspects of Christian Science. I. H. Rubenstein, Chicago.—p. 579.

Chronic Cicatrizing Enteritis.—Cushway presents a brief review of the literature of so-called "infectious granuloma" together with recent reports of this condition under the name "regional ileitis" and "cicatrizing enteritis." It seems to him that the term "cicatrizing enteritis" describes this condition best. Three cases are reported, two of which have been proved by definite pathologic changes. The third case is doubtful as to pathologic classification but showed the clinical and roentgenographic observations of "cicatrizing enteritis." The author believes that this pathologic condition may occur with a fair degree of frequency. The diagnosis can be made preoperatively only from roentgenologic studies. Crohn, Ginzburg and Oppenheimer, in isolating this condition from the confusion of benign inflammatory lesions, have demonstrated a new disease entity. Harris, Bell and Brunn have further clarified the situation by suggesting what seems to be a more descriptive term. The disease occurs mostly in young adults with symptoms of ulcerative colitis. Often these cases may be mistaken for appendicitis and operation may be performed. The disease eventually leads to obstruction of the small intestine with characteristic symptoms of obstruction. The physical observations are those of a tumor mass in the region involved with quite commonly the formation of a fistula. There is no definite known etiology. The pathology is constant both macroscopically and microscopically. The disease is benign and is most commonly found in the terminal ileum. The author hopes to stimulate an interest in this pathologic condition so that the roentgenologist will be on the alert and ready to recognize it.

Indiana State Medical Assn. Journal, Indianapolis

27: 505-554 (Nov. 1) 1934

The Indiana State Medical Association as Factor in Medical Education. E. E. Padgett, Indianapolis.—p. 505.
Relief of Pain in Sinusitis. W. C. Reed, Bloomington.—p. 508.
Hypertension: Observations on Two Hundred and Ninety-Three Examinations of Fifty Cases of Essential Hypertension. A. G. Moore, Deer Creek.—p. 509.
Lung Tuberculosis in Children. I. C. Barclay, P. D. Crimm, G. C. Johnson, H. Lynch, Evansville, and C. C. Wilson, New Haven, Conn.—p. 512.
Gas Gangrene Treated by Antiserum: Case Report. P. T. Holland and R. D. Smith, Bloomington.—p. 515.
Indications for Operation in Gallbladder Disease. H. S. Leonard, Indianapolis.—p. 515.
Indigent Relief Work. W. Coy, Indianapolis.—p. 518.

27: 555-604 (Dec. 1) 1934

The Problems of Acute Appendicitis. I. S. Ravdin, Philadelphia.—p. 555.
Diagnosis and Treatment of Uterine Bleeding. L. E. Burch, Nashville, Tenn.—p. 560.
Undulant Fever (Brucellosis), with Reference to One Hundred and Forty-Eight Cases Encountered In and About Dayton, Ohio. W. M. Simpson, Dayton, Ohio.—p. 564.
Fundamentals of Infant Feeding. H. D. Lynch, Evansville.—p. 571.
Ocular Manifestations of Systemic Disease. B. J. Larkin, Indianapolis.—p. 574.
The Tuberculin Test. W. H. Mytinger, Lafayette.—p. 579.

Iowa State Medical Society Journal, Des Moines

24: 549-602 (Nov.) 1934

The Relationship of Otolaryngology to General Medicine. J. J. Shea, Memphis, Tenn.—p. 549.
Lacrimal Duct Stenosis. R. F. French, Marshalltown.—p. 555.
Headaches: Their Etiology and Differential Diagnosis. C. C. Jones, Des Moines.—p. 559.
Painful Shoulder Syndrome. T. B. Throckmorton, Des Moines.—p. 565.
Early Rupture of Membranes. E. B. Woods, Des Moines.—p. 571.
Acute Intestinal Obstruction. B. R. Weston, Mason City.—p. 573.
Possibilities for Race Betterment. Eleanor Hutchinson, Belle Plaine.—p. 577.
Prevention of Rocker Sole in Club Foot Correction. V. A. Ruth, Des Moines.—p. 580.
Intestinal Obstruction Due to Gallstone. M. C. Hennessy, Council Bluffs.—p. 581.

Journal of Infectious Diseases, Chicago

55: 243-414 (Nov.-Dec.) 1934

Survey of Workers in Packing Plants for Evidence of Brucella Infection. Lucy S. Heathman, Minneapolis.—p. 243.
Staining of Processes (Flagella) of Human Erythrocytes. W. W. Oliver, Brooklyn.—p. 266.
*Precipitinogenic Action of Human Plasma and Its Constituents. L. Hektoen and W. H. Welker, Chicago.—p. 271.
Paratyphoid B in Western Norway: Bacteriology, Symptomatology, Morbid Anatomy and Epidemiology of Infection with Bacillus Paratyphosus B. T. M. Vogelsang, Bergen, Norway.—p. 276.
Infectious Dermatitis of Certain Marine Fishes. C. E. ZoBell and N. A. Wells, La Jolla, Calif.—p. 299.
*Relationship of Morphology of Diphtheria Bacillus to Its Virulence. Josephine J. Jarema and L. W. Smith, New York.—p. 306.
Experimental Sumatran Mite Fever in Guinea-Pigs. W. Kouwenaar and J. W. Wolff, Médan, Dutch East Indies.—p. 315.
Dissociation of the Gonococcus. Clara Raven, Chicago.—p. 328.
*The Cultural and Agglutinative Relationships of Intestinal Streptococci. J. C. Torrey and Elizabeth Montu, New York.—p. 340.
Selective Action of Gentian Violet on Enzymes. A. Y. Wells and N. P. Sherwood, Lawrence, Kan.—p. 356.
Determination of Minute Amounts of Tetanus Antitoxin in Serum. R. P. Knerr and G. A. Hottle, Philadelphia.—p. 360.
Streptococcus Food Poisoning. E. O. Jordan and W. Burrows, Chicago.—p. 363.
Dissociation and Filtration of Lactobacillus Acidophilus. N. Kopeloff, New York.—p. 368.
Experimental Production of Abscesses with Fusiform Bacilli by Aid of Scillaren-B. Ruth Tunnicliff and J. Klein, Chicago.—p. 380.
Serologic Relationship of Brucella and Pasteurella. L. E. Starr and G. E. Snider, Blacksburg, Va.—p. 384.
Salmonella Aertrycke Variant as Etiologic Agent of Paratyphoid in Pigeons. E. Jungherr and K. S. Wilcox, Storrs, Conn.—p. 390.
Bordet-Gengou and Löwenstein Mediums in Detecting Tubercle Bacilli in Sputum: Substitute for Guinea-Pig Inoculation. Lucy Mishulow, Marie Romano, Mildred Melman and Camille Kereszturi, New York.—p. 402.

Precipitinogenic Action of Human Plasma and Its Constituents.—Hektoen and Welker found that the intramuscular injection of human plasma or human serum into rabbits, especially when absorbed by aluminum hydroxide, results in a production of specific precipitins which may be continued for months. The precipitin reaction of human plasma or serum appears to result from the single or conjoint action of individual specific precipitins against the various antigens in the plasma or serum.

Relation of Morphology to Virulence of Diphtheria Bacillus.—During the course of the routine examination of 592 nose and throat cultures for virulent diphtheria bacilli, Jarema and Smith observed the following relationship between the morphology and the virulence of the organism: A greater percentage of virulence was obtained from mixed cultures of the diphtheria bacillus than from cultures of pure types. Cultures of diphtheria bacilli that were morphologically of the BT type, that is, bacilli which showed a tendency to bulge at one or both poles or anywhere along the body of the bacillus, were always found by inoculation of animals to be virulent. Of the virulent strains of diphtheria bacilli isolated, 59 per cent were of the BT type. Very distinct types of BT—a metachromatic granular bulging type and a blue mixture bulging type—may be considered virulent without the inoculation of animals. The elimination of the inoculation of animals with the BT type of the diphtheria bacillus would result in a saving of time and material. A clinical correlation was found between the presence of the BT type and the severity of the course of the disease in patients. Repeated virulence tests on cultures from diphtheria carriers and from patients with clinical diphtheria showed an apparent definite relationship between the morphology and the virulence of the diphtheria organism.

Cultural and Agglutinative Relationships of Intestinal Streptococci.—According to Torrey and Montu, no specific serologic type of enterococcus or diplostreptococcus was found associated with the lesions of nonspecific ulcerative colitis. Although one or more serologically related groups may be demonstrated by agglutination tests among enterococci isolated from the intestine showing structural changes, members of such groups show differences in antigenic constitution as revealed by reciprocal agglutinin absorption inconsistencies. No correlation is apparent between fermentative activities, resistance to heat and other biologic characteristics of enterococci and serologic relationships. Micrococcus zymogenes is a variant of the enterococcus. Strains of enterococci serologically related to the type reported by Saunders as specific for gastric and duodenal ulcers were found in the intestine but more frequently in patients showing intestinal lesions than in normal adults.

Journal of Nervous and Mental Disease, New York

80: 629-756 (Dec.) 1934

The Brain Changes in Chronic Alcoholism and Korsakow's Psychosis. F. J. Warner, Elgin, Ill.—p. 629.
Constructive Apraxia: Psychologic Views on Conception of Space. L. van der Horst, Amsterdam, Holland.—p. 645.
Pseudotabes Pituitaria. W. Needles, New York.—p. 651.
Clinical Studies on Particular Types of Depressive Psychoses: Their Differential Diagnosis from Schizophrenic Pictures and Some Remarks on Psychology of Depressions. P. Schilder, New York.—p. 658.

Journal of Urology, Baltimore

32: 541-728 (Dec.) 1934

*The Etiology of Stone. J. S. Joly, London, England.—p. 541.
Method of Hemostasis During Nephrotomy for Large Kidney Calculi. G. C. Prather, Boston.—p. 578.
Treatment of Bilateral Renal and Ureteral Calculi. R. E. Cumming, Detroit.—p. 600.
*Calculous Anuria in Acquired Single Kidney. L. Herman and L. B. Greene, Philadelphia.—p. 623.
*Horseshoe Kidney and the Relation of Nephritis and Calculous Formation to Anomalous Circulation: Report of Twenty-Five Cases. H. Sangree, D. Morgan, T. Klein and R. Trasi, Philadelphia.—p. 648.
Prostatic Calculi. H. H. Young, Baltimore.—p. 660.
Filariasis of Spermatic Cord and of Epididymis. J. C. Ferrer, San Juan, Puerto Rico.—p. 710.

The Etiology of Stone.—Joly, in his discussion of the etiology of calculus, believes that the hypothesis that stone is a deficiency disease is the most plausible and probable that has been advanced. It not only explains all the principal features of the condition known today but also gives a reason for the changes in its incidence during past years. He believes that the vitamin starvation acts primarily on the renal epithelium and through it on the colloid mechanism of the urine and that, once this mechanism is deranged, formation of stone must follow as a direct result of the laws of physical chemistry.

Calculous Anuria in Acquired Single Kidney.—Herman and Greene discuss calculous anuria occurring in single kidneys of surgical origin. The literature of the last five years contains reports of nineteen cases, to which the authors add four personal cases. The nephrectomized person, with few exceptions, is in little danger of calculous anuria, but this immunity is far greater in patients nephrectomized for conditions other than calculous pyonephrosis and those in whom the remaining kidney is normal at the time of operation. The available reports concerning the condition of the remaining kidney are meager. The authors have encountered a few anuric cases in which a stone was known to be present in the remaining kidney at the time of nephrectomy, but there were several, including one of their own cases, in which the remaining kidney had been operated on previously for stone. From their study they conclude that anuria with acquired single kidney is less fatal if properly treated than other types of obstructive anuria. Calculous anuria seldom occurs after nephrectomy for conditions other than calculous pyonephrosis. It apparently is rare if the remaining kidney is normal at the time of the original operation. It is prone to occur in the nephrectomized cystinuric patient. In the majority of cases the indwelling catheter should be employed to overcome the anuria in preparation for removal of the obstructive stone or stones. Certain small ureteral calculi, especially if impacted in the lower ureter, may be removed by cystoscopic methods. The primary purpose of operation is to establish free urinary drainage. This may be accomplished by

operation on the kidney or ureter as circumstances dictate, but primary ureterolithotomy is especially indicated in the case of large ureteral stones. In serious cases and especially those in which operation has been previously performed, nephrotomy with or without removal of the obstructive stone or stones is the method of choice. In the majority of cases the obstructive stone or stones may be removed without the infliction of too much damage to the kidney.

Horseshoe Kidney.—Sangree and his co-workers state that symmetrical horseshoe kidneys most commonly fuse by the lower pole, constituting the long kidney. They rarely fuse by the upper pole. Various degrees of dystopia and inclination to one side or the other may occur, represented by the "caked" kidney, the "sigmoid" and the L shaped kidney; these are classed as asymmetrical types. Fused kidneys are more commonly the seat of pathologic changes, especially those incident to urinary stasis, than are normal kidneys. All surgical procedures on horseshoe kidneys should consider the possibility of anomalous vessels, often multiple in number and variable in position. The wedge shaped arrangement of calculi in a urographic examination should suggest the presence of a fused kidney. Concomitant congenital anomalies should always be investigated in a study of a case of horseshoe kidney. Horseshoe kidney disease should be considered in every patient with an abdominal mass and the triad of symptoms of umbilical or lumbar pain, gastro-intestinal disorders and urinary disturbances.

Laryngoscope, St. Louis

44: 847-926 (Nov.) 1934

How to Obviate Failures in Results of Surgery in Otolaryngology: I. How to Obviate Failures in Results of Tonsillectomy. D. H. Jones, New York.—p. 847.

Id.: II. How to Obviate Failures in Results of Paranasal Sinus Surgery. R. E. Buckley, New York.—p. 853.

Id.: III. How to Obviate Failures in Results of Simple Mastoidectomy. M. F. Jones, New York.—p. 857.

Id.: IV. How to Obviate Failures in Results of Radical Mastoidectomy. J. R. Page, New York.—p. 861.

Id.: V. How to Obviate Failures in Results of Blood Vessel Surgery. D. Macpherson, New York.—p. 864.

Id.: VI. How to Obviate Failures in Results of Surgery of Brain Abscess. L. M. Davidoff, New York.—p. 871.

Part Played by Tonsils and Adenoids in Etiology of Rheumatic Fever. G. M. Coates and W. Gordon, Philadelphia.—p. 876.

Pathology of Chronic Sinusitis in Children. W. Spielberg, New York. —p. 885.

Practical Application of Voice Dynamics. L. Felderman, Philadelphia. —p. 902.

Unusual Location of Aberrant Thyroid. H. Sporn and H. Bolker, Brooklyn.—p. 920.

Cured Carcinoma of Nose and Antrum. M. H. Shutes, Oakland, Calif. —p. 924.

Michigan State M. Society Journal, Grand Rapids

33: 649-704 (Dec.) 1934

Surgery in the Management of Heart Disease. E. C. Cutler, Boston. —p. 649.

*The Common Cold. P. H. Long, Baltimore.—p. 655.

Edema and Water Balance. W. A. Thomas, Chicago.—p. 663.

Management of Occiput Posterior. W. C. Danforth, Evanston, Ill. —p. 668.

Advances in Neurosurgery. L. Davis, Chicago.—p. 672.

The Common Cold.—Long, in discussing the common cold, states that there is no specific remedy for the treatment of colds. His observations have led him to believe that the only rational treatment is to put the patient to bed at the onset of the infection and make him remain there for two or three days. Diet has little effect in the treatment of colds, but it is wise to force fluids moderately. A mild laxative is of value if constipation exists, and it is a good plan to treat the distressing features of the disease symptomatically. If such a regimen is followed, many infections will be aborted, many complications averted and many contact infections avoided. The multiplicity of the measures designed to prevent colds attests their lack of reliability. At present, hardening exercises, vitamin feeding, ultraviolet radiation and bacterial vaccines occupy the first rank of popularity as prophylactic measures designed to protect one against colds. When, however, the relation of the hardness of persons is correlated with their resistance to infections of the upper respiratory tract, it is found that the degree of hardness or softness of an individual has nothing to do with susceptibility to colds (Gafafer). Carefully controlled observations on the use of vitamins A and D are disappointing, and in a recent report Clausen suggested that too much vitamin A may predispose a child to respiratory tract infection. The clinical studies of Colebrook and of Doull and his associates have demonstrated quite definitely that ultraviolet radiation does not reduce the incidence of infections of the upper respiratory tract nor does it decrease the duration or severity of such diseases. The failure of vitamin therapy as a prophylactic measure in colds can be understood if one bears in mind that in general the national dietary is not lacking in these essential substances. Early reports seemed to show that the incidence, severity and duration of infections of the upper respiratory tract were materially lessened in subjects inoculated with bacterial vaccines. During the last fifteen years, however, carefully controlled studies have demonstrated that there is but little basis for the claims of the enthusiastic exponents of bacterial vaccines. The failure of bacterial vaccines in the prophylaxis of colds can be explained on the basis that the ordinary bacteria of the rhinopharynx have nothing to do with the initiation of the primary infection of the upper respiratory tract known as the common cold. That these vaccines have little effect in reducing the severity or duration of the infection can be understood if it is remembered that in man there is little evidence of pathogenic activity by the so-called secondary invaders in uncomplicated common colds. At present the only prophylaxis against colds is the avoidance of contact with infected persons. There is no other method.

Nebraska State Medical Journal, Lincoln

19: 401-440 (Nov.) 1934

Use of Morphine in Treatment of Acute Peritonitis. T. G. Orr, Kansas City, Kan.—p. 401.

Transportation and First Aid in Fractures of Extremities. C. F. Ferciot, Lincoln.—p. 404.

Correcting Deformities of Velum and Mesopharynx to Ensure Better Speech Following Cleft Palate Surgery. H. N. Boyne, Omaha. —p. 407.

Account of Influenza as It Appeared in Philadelphia, in the Autumn of 1789, in the Spring of 1790 and in the Winter of 1791. B. Rush, Philadelphia.—p. 410.

Treatment of Chronic Empyema Thoracis. J. D. Bisgard, Omaha. —p. 413.

Artificial Impaction of Fractures in Neck of Femur. H. F. Johnson, Omaha.—p. 416.

Postoperative Care. H. S. Andrews, Minden.—p. 419.

Rheumatic Fever in Children. J. H. Murphy, Omaha.—p. 424.

Acute Mastoiditis Bilateral, Lateral Sinus Thrombosis, Cerebellar Abscess, Operation and Recovery. H. E. Kully, Omaha.—p. 427.

New England Journal of Medicine, Boston

211: 949-992 (Nov. 22) 1934

Incisional Hernia: Analysis of Three Hundred Cases. C. D. Branch, Boston.—p. 949.

The Failure of Roentgen-Ray Therapy of Pituitary and Adrenals in Essential Hypertension. P. C. Baird, Boston; J. R. Lingley, Belmont, Mass., and R. S. Palmer, Boston.—p. 952.

Vital Function Studies: XII. Analysis of a Group of Children with Impaired Hearing. A. W. Rowe, Boston.—p. 954.

Exhibit of Fungi Pathogenic to Man Shown at the One Hundred and Fifty-Third Anniversary of the Massachusetts Medical Society. J. G. Downing, Boston, and S. M. Cousins, Cambridge, Mass.—p. 963.

211: 993-1038 (Nov. 29) 1934

Thrombosis of Deep Veins of Lower Leg, Causing Pulmonary Embolism. J. Homans, Boston.—p. 993.

Carcinoma of the Tonsil: Statistical Study of Two Hundred and Thirty Cases. L. A. Schall, Boston.—p. 997.

*The Heterophile Agglutination Test in Diagnosis of Infectious Mononucleosis. A. C. Van Ravenswaay, St. Louis.—p. 1001.

Industrial Surgery. F. J. Cotton and G. M. Morrison, Boston.—p. 1004.

The Austin-Flint Murmur and Its Differential Diagnosis. C. B. Leech, Providence, R. I.—p. 1007.

Observations on Certain Phases of the Health of Sixty-Two Normal Boys Over Period of a Year Together with a Description of a Method of Routine Physical Examination. J. H. Blodgett, Bellows Falls, Vt., and W. I. Mayo Jr., Westminster, Vt.—p. 1009.

The Heterophile Agglutination Test in Diagnosis of Infectious Mononucleosis.—Van Ravenswaay points out that two possible explanations have been suggested for the presence of sheep cell agglutinins in the serums of patients with infectious mononucleosis, the more obvious one being that the etiologic

agent of the disease, whether bacterial or virus in nature, serves as a heterogenic antigen in their production. As a precedent in such an assumption is the fact that the Shiga dysentery bacillus has been demonstrated to contain Forssman's antigen. An additional example of such a mechanism has been furnished recently by Buchbinder, who describes heterophile antibodies produced by organisms of the genus Pasteurella, which agglutinate avian erythrocytes. In contrast to this hypothesis, Meyer believes that the agglutinins normally present are merely increased in infectious mononucleosis. A similar type of increased serologic reaction has been noted in Berlin, where it has been found that frequently the serums of pregnant women agglutinate the Y dysentery bacillus in high titer. In attempting to determine whether other antibodies in the blood are increased in infectious mononucleosis, the author determined the diphtheria antitoxin content of the serums in four cases in which the heterophile agglutination test was strongly positive by intracutaneous titration in guinea-pigs. In none of them was the antitoxin content so high as is usually present in the serums of Schick negative persons. Until the cause of infectious mononucleosis and the details of its pathologic process are known, it is impossible to proceed further in explaining the reaction, and the latter must be used as an empirical procedure. It is similar in this respect to the Wassermann reaction in syphilis and to the Weil-Felix reaction in typhus.

New Orleans Medical and Surgical Journal

87: 355-424 (Dec.) 1934

Clinical Aspects of Amebiasis. S. K. Simon, New Orleans.—p. 355.
Review of One Hundred and Twelve Cases of Amebiasis. M. D. Hargrove, Shreveport, La.—p. 359.
*Diagnosis of Typhoid Fever in Infancy and Childhood: Study of Seventy-Five Cases. C. H. Webb, Shreveport, La.—p. 362.
*Simplified Treatment of Infantile Diarrhea. Eleanor Cook, Lake Charles, La.—p. 367.
Treatment of Acute and Subacute Infection of Pelvis, with Especial Reference to the Elliott Treatment. J. T. Sanders and T. B. Sellers, New Orleans.—p. 368.
Appendicitis During Pregnancy. J. P. Culpepper Jr., Hattiesburg, Miss.—p. 370.
The Rational Treatment of Diabetes Mellitus. U. Giles, New Orleans.—p. 373.
Dietary and Glandular Deficiencies in Eye, Ear, Nose and Throat Diseases. D. W. Hamrick, Corinth, Miss.—p. 378.
Jaundice Associated with Hyperthyroidism. H. R. Mahorner, New Orleans.—p. 382.
Simple Continuous-Flow Blood Transfusion Instrument. M. DeBakey, New Orleans.—p. 386.
Mikulicz's Syndrome: Case Reports. W. H. Browning, Shreveport, La.—p. 389.

Diagnosis of Typhoid in Childhood.—Webb observed seventy-five cases of typhoid in children in which the manifestations were quite different from the adult type. Sudden onset is the rule in young children; the most frequent early symptoms are fever, headache and abdominal pain. The disease usually follows one of these courses: (1) mild disease of short duration and variable symptoms, (2) a more severe attack with predominant nervous symptoms or (3) an occasional severe gastro-intestinal upset. A palpable spleen, a red tipped tongue and abdominal tenderness or distention were the predominant physical symptoms. Bradycardia and dicrotic pulse were seldom observed in younger children. Leukopenia is unusual in the child less than 5 years of age. An attitude of suspicion toward all fevers and an alert clinical study are necessary for the diagnosis of typhoid in the young child.

Simplified Treatment of Infantile Diarrhea.—Cook points out that the reaction of stools in diarrhea gives the indication for the treatment and that the simple litmus paper test can be made easily not only by the physician but by the nurse or other attendant. It is an accepted procedure in urinary infections, but is not, she thinks, used sufficiently and appreciated in the diagnosis and treatment of intestinal infections; and too often patients with alkaline stools are put as a routine on a skimmed milk diet, sometimes with alarming and disastrous consequences. She has found a nonprotein diet effective in diarrhea of typhoid in which the stools are alkaline and in the diarrhea from improper food in which the stools are alkaline. In cases in which there are loose acid stools there is usually a ready response to an easily assimilated protein diet with plenty of fluids, after a preliminary cleansing of the intestinal tract with castor oil.

Philippine Islands Med. Association Journal, Manila

14: 373-420 (Oct.) 1934

Treatment of Acute, Nontuberculous Empyema of Pleura. R. Demel, Vienna, Austria.—p. 373.
Cancer, Manifestation of Extraordinary Cellular Activity Caused by Metabolic Disorders. M. M. Gallardo, Dumaguete, Occidental Negros.—p. 381.
Electrocoagulation of Hemorrhoids. R. L. Blanco, Cebu, Cebu.—p. 396.

Philippine Journal of Science, Manila

54: 1-220 (May) 1934

Retothel Sarcoma Among Filipinos in the Tropics. C. M. Hasselmann, Manila.—p. 1.
Experimental Studies on Curative Treatment of Surra in Native Horses in the Philippines, I. L. M. Yutuc, Manila.—p. 9.
Studies in Surra: II. Pseudoreactions in Complement Fixation Tests for Trypanosomiasis. R. Randall, Manila.—p. 29.
Malaria and Anopheles Reconnaissance in the Philippines: II. P. F. Russell, New York.—p. 43.
Vitamin Content of Philippine Foods: III. Vitamin B in Various Fruits and Vegetables. A. J. Hermano and G. Sepulveda Jr., Manila.—p. 61.
Philippine Panao (Dipterocarp) Resin. Simeona Santiago Tanchico, A. P. West and J. Fontanoza, Manila.—p. 75.
Lane-Eynon Volumetric Method for Determination of Lactose in Milk. F. T. Adriano, S. B. Oliveros and L. G. Miranda, Manila.—p. 83.
Mutillidae of the Philippine Islands. C. E. Mickel, Minneapolis.—p. 91.

Southern Medical Journal, Birmingham, Ala.

27: 983-1074 (Dec.) 1934

The Foundation of Longevity. H. L. Moore, Dallas, Texas.—p. 983.
*Dissociation of Thyroid from Sympathetic Nervous System and Reduction of Blood Supply to Thyroid in Angina Pectoris: Preliminary Report. J. A. Lyon and E. Horgan, Washington, D. C.—p. 985.
Bichloride of Mercury Poisoning: Sodium Formaldehyde Sulphoxylate as an Antidote. L. A. Monte and E. Hull, New Orleans.—p. 988.
Leukopenia in Tuberculosis: Report of Case Showing Complete Neutropenic Episode for One Week with Recovery. C. H. Cocke, Asheville, N. C.—p. 990.
Trend of Tuberculosis Mortality in Baltimore and Eight Other Cities, 1812-1932. J. Collinson, Baltimore.—p. 992.
Whooping Cough: Its Early Diagnosis, Prevention and Treatment. L. Sauer, Evanston, Ill.—p. 1002.
Physical Methods in Treatment of Diseases of Skin. G. M. MacKee, New York.—p. 1006.
Some Unsolved Problems in Ophthalmology and Otolaryngology. D. Roy, Atlanta, Ga.—p. 1011.
Obstetric Progress During the Past Twenty-Five Years. W. T. Pride, Memphis, Tenn.—p. 1014.
Need for Broader Conceptions in Medicine. W. W. Young, Atlanta, Ga.—p. 1017.
Epidemic Pleurodynia. J. L. Callaway, Durham, N. C.—p. 1019.
Raw Apple Diet in Treatment of Diarrhea of Children. W. H. McCaslan, Union Springs, Ala.—p. 1021.
The Pathology of Avitaminosis. H. S. Thatcher, Little Rock, Ark.—p. 1023.
Fractures of Neck of Femur, Recent and Old: Report of Six Hundred and Thirty-One Cases. M. S. Henderson, Rochester, Minn.—p. 1032.
Medical Education and the Public. E. B. McKinley, Washington, D. C.—p. 1039.
Rôle of the Small General Hospital in the Reduction of Maternal Mortality. W. Z. Bradford, Charlotte, N. C.—p. 1044.
How May the Health Officer Determine an Effective Prenatal Service? M. H. Jensen, Louisville, Ky.—p. 1047.
The Physician as Ruler. E. Podolsky, Brooklyn.—p. 1053.

Dissociation of Thyroid from Sympathetic Nervous System and Reduction of Blood Supply to Thyroid in Angina Pectoris.—Lyon and Horgan observed that the division and ligation of both superior and inferior thyroid arteries, when a subtotal thyroidectomy was performed, prevented the recurrence and persistence of hyperthyroidism and produced a beneficial effect on the hearts of the patients in a large series of cases. These observations led them to believe that the division and ligation of the thyroid arteries in cases of angina pectoris and congestive heart failure would produce correspondingly beneficial effects on the hearts of the patients and relieve them of symptoms. They performed the operation in two cases of angina pectoris, one with anginal failure and the other accompanied by aortic regurgitation and congestive failure. The operation relieved both patients of anginal attacks and the one of his congestive failure. It has enabled the patients to lead relatively active lives. The division of both superior and inferior thyroid arteries decreases the amount of blood entering the thyroid and cuts off all stimuli from the sympathetic nervous system to the gland. The effect of thus curtailing thyroid activity is to lower the metabolic rate, to decrease the circulatory demands and, therefore, to lessen the work of the heart.

The operation produces no change in the eyes (Horner's syndrome), lowers the basal metabolic rate, but does not produce myxedema, and will not, the authors believe, disturb calcium metabolism.

Southwestern Medicine, Phoenix, Ariz.

18: 359-390 (Nov.) 1934

Common Sense About Medical Ethics. M. I. Leff, Glendale, Ariz.—p. 359.
Problems of the Claims Department of the Industrial Commission. C. L. Guynn, Phoenix, Ariz.—p. 370.
Allergic Reaction: Important Cause of Abdominal Pain. F. D. Garrett, El Paso, Texas.—p. 376.
Pulmonary Syphilis: Report of Case. R. B. Homan Jr., El Paso, Texas.—p. 379.

Surgery, Gynecology and Obstetrics, Chicago

59: 841-972 (Dec.) 1934

*Gelatinous Carcinoma of the Breast. B. J. Lee, H. Hauser and G. T. Pack, New York.—p. 841.
Relation of Recovery of Different Sensory Branches of Peripheral Nerves to Motor Recovery. L. J. Pollock, Chicago.—p. 858.
*Experimental Bone Regeneration: Using Lime Salts and Autogenous Grafts as Sources of Available Calcium. W. J. Stewart, Columbia, Mo.—p. 867.
Use of Small Dosages of Pituitary Extract in Obstetrics: Review of Last Twenty-Two Years. A. Stein, New York.—p. 872.
Adamantine Tumors of the Jaws. S. G. Major, J. R. Bell and R. S. DeWaters, Pittsburgh.—p. 876.
Effect of Mechanical Stimulation of Nipples on Ovary and Sexual Cycle. H. Selye and T. McKeown, Montreal.—p. 886.
Funnel Pelvis: Its Incidence and Importance, and New Pelvimeter for Outlet Mensuration. R. J. Pieri, Syracuse, N. Y.—p. 891.
Sterility of Surgical Catgut Sutures, with Particular Reference to Foreign Made Catgut. R. O. Clock, New York.—p. 899.
Operation for Phimosis. E. Pólya, Budapest, Hungary.—p. 904.
Exploration of Common Duct in Gallstone Surgery. H. M. Clute and N. W. Swinton, Boston.—p. 906.
Factors Influencing Variety and Position of Occipital Presentation and Mechanism of Engagement. W. C. Stude, St. Louis.—p. 913.
*Treatment of Varicose Veins: Anatomic Factors of Ligation of the Great Saphenous Vein. E. A. Edwards, Brookline, Mass.—p. 916.
Roentgenologic Diagnosis of Meckel's Diverticulum. G. E. Pfahler, Philadelphia.—p. 929.
End Result Study of Humeral Shaft Fractures. H. Rogers, Boston.—p. 934.

Gelatinous Carcinoma of the Breast.—Lee and his associates point out that gelatinous carcinomas occur in many organs of the body which normally secrete mucus. A rare type is that occurring in the breast. Its incidence ranges between 1 and 2 per cent of all cancers of the breast. Gelatinous carcinoma of the breast occurs in two main forms: (1) primary gelatinous carcinoma, in which the gelatinous features predominate, and (2) ordinary carcinoma of the breast with secondary gelatinous degeneration. The latter type may be divided into the myxoid or mucoid carcinoma, depending on whether the gelatinous changes arise by metaplasia in the connective tissue or by secretion directly from the carcinoma cells respectively. In the majority of cases the epithelial cells of the tumor are the source of the gelatinous material by a secretory process. Less frequently the connective tissue assumes myxoid characteristics by a degenerative process. Gelatinous carcinoma of the breast is usually slower in growth than the ordinary carcinoma. One of the reasons given for this fact is that the tumor arises on the basis of a preexisting benign mammary adenoma in many instances. No essential differences are observed in age, sex and race distribution and history of lactation and of trauma between the gelatinous and ordinary mammary carcinomas. The diagnosis of gelatinous carcinoma of the breast is made on the slow growth of the tumor, Halstead's sign, the usual signs and symptoms of ordinary breast carcinoma and the aspiration or punch biopsy. Metastases from it occur late in the course of the disease as compared with the usual type of mammary carcinoma, are usually confined to the axillary lymph nodes, and do not necessarily show gelatinous changes. The end results of the authors' thirty cases indicate a considerably higher percentage of cures than in the usual types of carcinoma of the breast. The degree of malignancy is lower than in other carcinomas of the breast, as evidenced by 57 per cent of five year cures as compared with 41 per cent in a control group.

Experimental Bone Regeneration.—Stewart in his experimental study, in an attempt to verify the observations of Murray on bone degeneration, found that boiled bone grafts died and, when inserted into defects of the radius, there was no production of new bone about or within them. The only source of new bone formation was from the ends of the radius. Small fragmented live grafts used similarly were the sources of large amounts of new bone growth in each instance. Throughout the entire series of experiments, whenever a small bone chip was left behind at operation there was evidence of active bone growth from it. In all cases in which lime salts were implanted in the radial defects there was failure of regeneration of the shaft. The only effect of mixing traumatized muscle and lime salts in the radial defects was to create a few areas of calcification in necrotic tissue. No regeneration of the shaft took place. The only constant effect of implanting lime salts in carpal and tarsal defects was the production of a definite proliferative arthritis. No bone was laid down in the defects.

Treatment of Varicose Veins.—Edwards gives the criteria used in any given case of varices at the Circulatory Clinic at the Boston City Hospital. At the patient's first visit the actual presence of varices and whether they occur in the distribution of the greater or lesser saphenous, the condition of the great saphenous vein and whether there is a positive Trendelenburg test, the condition of the valves of the perforating veins and the condition of the deep veins are determined. If the varices are limited to the distribution of the lesser saphenous vein, the injection treatment alone is used. The solutions employed are quinine ethyl carbamate for the small or medium sized varices, a 20 per cent solution of sodium chloride for the large varices, and a 5 per cent solution of sodium morrhuate for angiomas. If the varices are in the distribution of the great saphenous vein but the vein is not widened and the Trendelenburg test is negative, the injection treatment alone is used. If the Trendelenburg test is positive, the patient is hospitalized for ligation at the saphenofemoral junction, and the distal segment is injected with invert sugar and sodium chloride and then followed up in the outpatient department with injections as in the cases with negative Trendelenburg tests. If the Trendelenburg test is doubly positive, the saphenous is ligated, the incompetent perforation is excised and the remainder is injected in the outpatient department. These cases are relatively uncommon. In cases of obliteration of deep veins, it is a good rule not to disturb the superficial varices. The author has injected the varices in the lower leg in a case of occlusion of the inferior vena cava, with much improvement. In this case, however, the original deep phlebitis had not involved the deep veins of the leg proper. Patients with ulcer are treated according to the foregoing criteria, but injection is given cautiously far away from the ulcer until it is free from infection and, sometimes, the injection is not given until the inflammation is reduced by ligation alone or by supportive dressings. It has not been found necessary to excise an ulcer. If there is an incompetent perforator beneath the ulcer, the ulcer can be healed temporarily by ligation and injection. The perforator may then be excised several weeks after the ulcer is healed. Patients with phlebitis are treated as are patients with ulcer. The progress of the phlebitis is stopped by the ligation or small injections far from the phlebitic focus.

Wisconsin Medical Journal, Madison

33: 797-868 (Nov.) 1934

Reducing Hazards in Treatment of Intestinal Obstruction. E. H. Mensing, Milwaukee.—p. 807.
Common Duct Obstruction: Case Report. L. Milson, Green Bay.—p. 817.
Roentgenologic Diagnosis of Congenital Dislocation of Hip. S. A. Morton and W. P. Blount, Milwaukee.—p. 821.
Bilateral Paralysis of Recurrent Laryngeal Nerve Following Thyroidectomy. J. B. Hitz, Milwaukee.—p. 825.
Splenomegaly and Anemia: Diagnostic Problem. J. E. Gonce Jr., Madison.—p. 831.
Lateral Sinus Thrombosis Complicating Acute Mastoiditis. A. G. Dunn and W. F. Cowan, Stevens Point.—p. 836.
Biliary Peritonitis Without Apparent Perforation. A. R. Tormey, Madison.—p. 839.
Treatment of Tetanus: Case Report. M. Trautmann, Prairie du Sac.—p. 840.
Primary Carcinoma of Liver Clinically Simulating Empyema of Gallbladder: Report of Case. B. H. Schlomovitz and L. G. Glickman, Milwaukee.—p. 841.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

7: 513-576 (Sept.) 1934

Marie Sklodowska-Curie 1867-1934. C. Regaud.—p. 522.
Bronchiectasis. P. Kerley.—p. 531.
Wall Absorption and Buckling Strength of Cylindric Radium Containers. G. W. C. Kaye, G. H. Aston and W. E. T. Perry.—p. 540.

British Medical Journal, London

2: 929-976 (Nov. 24) 1934

Causation and Treatment of Edema. T. I. Bennett.—p. 929.
Chronic Cervicitis: Its Influence on Urinary Tract and Its Treatment by Diathermy Cutting Current Curet. J. C. Ainsworth-Davis.—p. 935.
Gas Gangrene Restricted to Subcutaneous Tissues: Report on Case. Margaret Moore White.—p. 937.
*Interference in the Schick Test by Diphtheria Antitoxin Injection in the Human Subject. R. B. Mayfield.—p. 938.
*Evipan Paralysis: Case. J. V. Landor and M. Salleh.—p. 940.

Interference in Schick Test by Diphtheria Antitoxin Injection.—In an investigation as to how soon an injection of antidiphtheritic serum may be given in a suggestive case of diphtheria after the performance of a Schick test without invalidating the result of that test, Mayfield found that two hours is sufficient to get a reliable result to that test. It has been demonstrated that antidiphtheritic serum is much more efficient in inhibiting a positive Schick reaction when introduced by the intravenous route than by the intramuscular.

Barbituric Acid Paralysis.—Landor and Salleh report a case of widespread paralysis following the use of a derivative of barbituric acid (evipan) for general anesthesia with no premedication. It was suggested that the case was one of acute beriberi, but the prolonged unconsciousness after the injection and the great loss of power in the trunk muscles were against such an explanation. The authors think that it was an undoubted case of late paralysis due to the administration of the anesthetic. Caution needs to be taken regarding dosage in patients already toxic.

Journal of Physiology, London

82: 393-520 (Nov. 12) 1934

Action of Adrenalin on Serum Potassium. J. L. D'Silva.—p. 393.
Toxemia and Carbohydrate Metabolism. A. B. Corkill and S. Ochoa.—p. 399.
Actions of Insulin and Adrenalin in Young Adrenalectomized Rabbits. O. Cope and A. B. Corkill.—p. 407.
Gaseous Interchanges Through Visceral Pleura of the Cat. M. Kremer, A. T. Wilson and S. Wright.—p. 414.
Repetitive Stimulation by Commutator and Condenser. A. V. Hill.—p. 423.
Curariform Activities of Strychnine Methosalts and Curarine Chloride. S. L. Cowan and H. R. Ing.—p. 432.
Renal Elimination of Phenol Red. H. L. Sheehan and H. Southworth.—p. 438.
Temperature Changes and Winter Sleep of Bats. R. C. Burbank and J. Z. Young.—p. 459.
Glycogen Content of the Rat Heart. G. Evans.—p. 468.
Observations on Composition of Alveolar Air on Everest, 1933. R. Greene.—p. 481.
Experiments on Variations in Blood Composition. S. J. Folley and G. L. Peskett.—p. 486.
Apparent Change of Hydrogen Ion Concentration on Stretching a Muscle. R. Margaria.—p. 496.
Output of Fetal Heart in the Goat. J. Barcroft, L. B. Flexner and T. McClurkin.—p. 498.
Relation Between Total and Initial Heat in Single Muscle Twitches. L. Bugnard.—p. 509.

Lancet, London

2: 1031-1088 (Nov. 10) 1934

Hemochromatosis. J. H. Sheldon.—p. 1031.
Treatment of Tetanus. H. W. Florey, H. E. Harding and P. Fildes.—p. 1036.
*Diagnosis and Treatment of Doubtful Mammary Tumors. M. C. Tod and E. K. Dawson.—p. 1041.
Treatment of Postoperative Retention of Urine. N. R. Barrett.—p. 1046.

Diagnosis and Treatment of Mammary Tumors.—Tod and Dawson group benign and doubtful mammary lesions that give rise to considerable difficulty in diagnosis into (1) benign tumors, (2) chronic infections, (3) cystic changes, (4) early carcinoma, (5) acute carcinoma, simulating infection, (6) pregnancy and lactation tumors and (7) fat necrosis. They discuss the characteristics of each type and point out that, before deciding on the extent of treatment necessary in these benign and doubtful mammary tumors, the surgeon should consider various points in the history—age, duration of the growth, previous pregnancy and lactation, presence or absence of pain, discharge from the nipple, infection—and, in the examination, mobility or fixation, fluctuation, size, consistency and definition of the lump, retraction of the nipple and the condition of the axillary lymph nodes. None of these signs or symptoms are in themselves diagnostic, but a careful evaluation of each may provide a signpost that points to a benign or malignant growth. Age is an important factor, for no tumor of the breast in a woman more than 35 years of age can be regarded as certainly benign. The surgeon who decides to operate on a doubtful tumor has several roads open to him—local excision of the tumor, simple mastectomy and radical operation. The authors' analysis of a large series of doubtful tumors, with known later history, suggests that the two-stage operation is not dangerous but is undesirable. In women more than 35 years of age, simple mastectomy with immediate gross examination of the breast and submission of the tissue for microscopic examination is the method of choice for diagnosis. Should the tumor appear malignant to the naked eye, the radical operation should be completed at once. Diagnostic mastectomy should be performed as the best initial stage of treatment in women of cancer age with a doubtful tumor of the breast, except in cases of acute (inflammatory) carcinoma and pregnancy and lactation tumors.

Medical Journal of Australia, Sydney

2: 469-500 (Oct. 13) 1934

The Development of the Australian People. J. H. L. Cumpston.—p. 469.
Medical Men as Pastoral Pioneers. E. A. Mackay.—p. 476.
Some Aspects of an Influenza Epidemic (1933). K. W. Starr.—p. 483.

2: 501-530 (Oct. 20) 1934

Civilization's Food as the Possible Origin of Dental Disease. T. T. Alkin.—p. 501.
Periodontitis and Its Genesis: Notes. H. Sutton.—p. 506.
Etiology of Dental Caries. F. S. Hansman and F. Marshall.—p. 511.

2: 531-566 (Oct. 27) 1934

Part Played by Focal Infections in Medicine Today. S. Pern.—p. 531.
Cutaneous Moniliasis. J. C. Belisario.—p. 538.
Local Anesthesia in Operations on Mastoid and on Maxillary Antrum. R. E. Buckingham.—p. 542.
Special Methods in Diagnosis of Subacute Obstruction of Small Intestine. C. Craig.—p. 545.

2: 567-596 (Nov. 3) 1934

Principles of Treatment of Acute Infections of Lungs. S. A. Smith.—p. 567.
Estimation of Glucose in One-Tenth Milliliter of Blood by a Modified Folin-Malmros Method. H. S. H. Wardlaw and Elizabeth M. A. Pirie.—p. 571.
Dermatitis Caused by Mite (Pediculoides Ventricosus) and Its Occurrence in Australia. D. C. Swan.—p. 573.
History of Tuberculosis: Notes. C. Harvey.—p. 578.

Medical Press and Circular, London

189: 383-404 (Oct. 31) 1934

Modern Treatment in General Practice: Fractures Around Elbow Joint in Children. A. L. d'Abreu.—p. 386.
*Treatment of Habit Vomiting in Infants. E. Pritchard.—p. 390.
Achlorhydria: Its Clinical Significance and Treatment. S. J. Hartfall.—p. 393.
Intramuscular Injection of Quinine in Pneumonias. T. Thomas.—p. 396.

Treatment of Habit Vomiting in Infants.—Pritchard states that the cure of habit vomiting differs with the cause, but in all cases it consists essentially in the reeducation of a faultily acquired motor function and in the breaking of a pathologic or a conditioned reflex. In those cases in which the pyloric reflex is at fault, that is to say, when a hypertonic sphincter refuses to relax in obedience to the inhibitory impulses of the vagus, the rational treatment is to remove the cause or causes that excite hypertonicity and combine this with the use of sedative drugs. The author usually commences treatment by giving one teaspoonful of some simple fluid, and if that is retained he then gives two teaspoonfuls at the next feeding, and so on, at intervals of two hours until the quantity reaches from 2 to 3 ounces (60 to 90 cc.). He then adds dry whey powder to the fluid, at first in small amount but always in increasing quantity, until it reaches three teaspoonfuls at each feeding. If up to this point the food has been well retained,

he adds 10 drops (0.6 cc.) of cream at a time, gradually increasing the amount until 1 drachm (4 Gm.) is used. Dry milk is next substituted for the foregoing mixture, beginning with 10 grains (0.65 Gm.) and working up to the full amount indicated by the age and weight of the baby. By these means an operation may generally be avoided. In combination with this dietetic treatment the pyloric sphincter may be coaxed into submission by the simultaneous administration of sedative or anodyne drugs. Undiluted condensed milk is suited to the requirements, for no matter how concentrated it may be it is digested easily and its caloric value is five times that of undiluted cow's milk, so that small quantities will supply the required number of calories.

Tubercle, London

16: 49-96 (Nov.) 1934

Report on Example of Congenital Bronchiectasis with Results of Postmortem and Pathologic Investigation. W. B. Wood.—p. 49.
Forlanini's Original Communication on Artificial Pneumothorax. S. Lojacono.—p. 54.
Contribution to Surgical Therapy of Phthisis: Ablation of Lung? Artificial Pneumothorax? C. Forlanini.—p. 61.

Japanese Journal of Experimental Medicine, Tokyo

12: 333-410 (Aug. 20) 1934

Virus of Pemphigus Pruriginosus. T. Taniguchi, S. Kuga, S. Okamoto and Z. Masuda.—p. 333.
Studies on Mechanism of Wassermann Reaction. J. Nakayama.—p. 339.
Method for Measuring Antigenity of Diphtheria Toxoid. T. Tanaka.—p. 363.
Studies on Bacterium Tularense: II. Improved Culture Medium for Bacterium Tularense (Egg Yolk-Serum). M. Kudo.—p. 371.
Id.: III. Experimental Examination on Immunity Against Infection with Bacterium Tularense. M. Kudo.—p. 377.
Studies on Ricin: First Report. H. Moriyama.—p. 395.

Japanese Journal of Obstetrics and Gynecology, Kyoto

17: 255-324 (Aug.) 1934

Influence of Albino Rat Body Fluid in Deficiency Disease of Vitamin B on Continuance of Vitality of Spermatozoa. J. Ueno.—p. 256.
Deficiency of Vitamin B and Endocrine Glands of Female White Rats. J. Ueno.—p. 267.
Clinical Observation on Early Detachment of Normally Situated Placenta: Study on Treatment. Y. Katsu and H. Yamamura.—p. 279.
Cytologic Study of Living Body Irradiated with Hard Ray: Part I. Influence of Hard Ray on Development of Beans and Abnormality of Nuclei and Cell Division. T. Saito.—p. 285.
Study of Appendicitis in Gynecology. K. Mitsui.—p. 291.
*Experiment of Lead Poisoning in Pregnancy. K. Mitsui.—p. 304.
Functional Biologic Study of Statistics of Ectopic Gestation. N. Kawashima, S. Tsuneoka and Y. Ebara.—p. 309.

Experimental Lead Poisoning in Pregnancy.—Mitsui produced lead poisoning in ninety-four pregnant rabbits (most passed more than twenty days of pregnancy) and carried out the histologic and the histochemical tests by the method of Iwahashi on the fetuses, livers, kidneys and placentas. He compared the relation between the distribution and the histologic changes in the organic tissues to find what disturbance took place in the pregnancy as a result of the poisoning. As soon as lead was administered to the pregnant rabbits, intense anemia developed. The blood obtained by perforating the auricular vein presented a bright red watery appearance and decreased markedly in coagulability; gastric dysfunction, a decrease in body weight, often stillbirth and premature delivery were observed.

Journal of Oriental Medicine, South Manchuria

21: 39-66 (Oct.) 1934

Distribution of Parasites and Parasitic Diseases in Manchoukuo. K. Hiyeda.—p. 39.
Investigations on Amebic Dysentery: II. Experimental Studies on Amebic Dysentery in Rats: Part I. Amebic Dysentery of Rats in Acute Stage. E. Kitabatake.—p. 57.
Influences Exerted by Anesthesia on Temperature of Skin: Cutaneous Temperature During Local and Spinal Anesthesia. G. Irie.—p. 59.
Toxin Production on Semisynthetic Medium: Studies on Diphtheria Toxin I. T. Komiyama.—p. 60.
Purification of Diphtheria Toxin by Calcium Phosphate: Studies on Diphtheria Toxin II. T. Komiyama.—p. 61.
Rapid Method of Hyperimmunization of Horses Against Diphtheria Toxin. K. Kurauchi, T. Komiyama and E. Ando.—p. 62.
Pathologic Study of Nerve Center System in Morphinism: Part III. Experiments on Dogs. A. Hayashi.—p. 63.
Distribution of Kala-Azar in the Southern District of Manchoukuo: Part I. Distribution in Shusuishi District. M. T. Sei.—p. 65.

Paris Médical

2: 289-320 (Oct. 20) 1934

Medical Diseases of Kidneys in 1934: Annual Review. F. Rathery and M. Dérot.—p. 289.
*Application of Concept of Filtration-Reabsorption to Study of Renal Pathogenesis. P. Govaerts.—p. 305.
Etiology and Pathogenesis of Renal Lithiasis. F. Rathery and P. Froment.—p. 309.
Urology in 1934: Annual Review. R. Dossot and A. Béchet.—p. 314.

Filtration-Reabsorption Theory in Renal Pathogenesis.—Govaerts believes that the filtration reabsorption concept clarifies many of the obscure points in renal physiopathology. He states that he has been able to confirm the work of Poulsson on the elimination of dextrose in phlorhizinized animals. The theory states that the glomerular tufts eliminate creatinine, urea and dextrose in the same concentration as in the blood, but that normally the dextrose is entirely reabsorbed. Under the influence of phlorhizin the reabsorption of dextrose is prevented so that, if this action is pushed to the limit, all the dextrose filtered at the glomerular level should be found in the urine. The elimination of creatinine allows the quantitative estimation of this filtrate. In considering the diabetic subject and the supposed variation of the threshold in the same person, he feels, as a result of observations on seven patients, that the excretion of dextrose varies in the same sense as that of the creatinine and has no relation to the elimination of water. Finally, in considering the various forms of Bright's disease, he concludes that the pure dropsical syndrome is based on a glandular lesion that renders the capillaries permeable to the proteins but does not affect the circulation. The changes in the tubules, which may be anatomically marked, are nothing but the sign of a cellular degeneration. In the uremic and hypertensive syndromes the situation is different. The usual alteration in the uremic syndrome is an inflammatory process involving glomeruli and interstitial kidney tissue. He believes that these anatomopathologic and clinical differences are more easily explained on the basis of the filtration reabsorption concept of kidney function.

Policlinico, Rome

41: 579-646 (Nov. 15) 1934. Surgical Section

*Influence of Suprarenals on Formation of Callus. G. Lucchese.—p. 579.
Experimental Surgery of Inferior Vena Cava. G. Montemartini.—p. 593.
Treatment of Parathyroprival Tetany. B. Paggi.—p. 639.

Influence of Suprarenals on Formation of Callus.—Lucchese made observations on the evolution of experimental fractures in three groups of rabbits: (1) those previously subjected to either unilateral total or bilateral partial suprarenalectomy, (2) normal rabbits given subcutaneous injections of cortical extract and (3) normal rabbits, for control, that did not receive any treatment before or after the fracture was caused. Rabbits subjected to bilateral suprarenalectomy died. The osteogenesis was poor in the survivors of the first group, good in controls and excellent in the animals receiving the injections of cortical extract. The author says that the results of his experiments prove that suprarenal insufficiency retards the formation and favorable evolution of callus in comparison with the results observed in control animals, while the repeated injections of cortical extract provoke the accelerated evolution of an exuberant callus formation.

Prensa Médica Argentina, Buenos Aires

21: 1947-1996 (Oct. 17) 1934

Anatomic Basis for Treatment of Trigeminal Neuralgia by Neurolytic Injections. J. Pereyra Käfer.—p. 1947.
Medicoforensic Aspects of Hernias. B. B. Spota.—p. 1970.
*Alkali Reserve in Tuberculosis. S. Gutman.—p. 1974.
Anterosuperior Pleuromediastinal Pneumatocele in Course of Artificial Pneumothorax. A. P. Heudtlass, O. Garré and J. Schicht.—p. 1985.

Alkali Reserve in Tuberculosis.—Gutman made determinations of the alkali reserve in two groups of patients suffering from pulmonary tuberculosis: eighteen from chronic, stationary, incipient and unilateral forms, and thirty-four from grave, acute tuberculosis in rapid evolution and in the preagonal stage. Some patients in this group had unilateral or bilateral artificial pneumothorax or pleurisy as a complication. The determinations were made by the method of Van Slyke with

the patients fasting and again after eating. The alkali reserve proved to be normal in patients of the first group and greatly diminished and tending to the development of acidosis in the second group. In these the organs concerned with the functions of neutralization of acids in the blood, especially the liver and the kidney, are in a decadent condition and the bulbar center, owing to chronic intoxication, is prevented from fulfilling its functions of elimination of the carbon dioxide and acids in the blood. Thus a vicious circle is established: The acid milieu of the blood prepares and favors the development of tuberculosis, which in turn provokes acidosis. Volumes of alkali reserve as low as 44, 42 and even 34 in one case, such as those observed by the author in patients having grave forms of tuberculosis, have not been previously reported, although all authors agree to the fact that the alkali reserve decreases as tuberculosis progresses and that the acidosis reaches its highest figures in preagonal stages of the disease.

Semana Médica, Buenos Aires

41: 1149-1224 (Oct. 18) 1934. Partial Index

*Glycemia in Pulmonary Tuberculosis Without Diabetes. R. A. Izzo and M. Sagastume.—p. 1149.
*Transplacental Heredity of Tuberculosis. N. Palacios Costa and M. V. Falsia, with Collaboration of Colillas and Marchisio.—p. 1156.
Physiopathogenesis of Cyanosis in Tumors of Mediastinum. F. C. Arrillaga and A. C. Taquini.—p. 1160.
Etiology of Senile Cataract. Paulina Satanowsky and P. Kurlat.—p. 1163.
Transfusion of Preserved Blood. R. Palazzo and J. Tenconi.—p. 1179.

Glycemia in Pulmonary Tuberculosis Without Diabetes.—In a group of 752 patients having pulmonary tuberculosis in different stages of evolution, Izzo and Sagastume performed 1,200 determinations of the glycemia, according to the method of Folin-Wu, and of provoked hyperglycemia, according to Escudero's technic (oral administration of 2 Gm. of a 20 per cent solution of dextrose per kilogram of theoretical weight). The authors conclude that in patients with pulmonary tuberculosis glycemia, during fasting, oscillates within physiologic limits. There is neither true hypoglycemia, even in dying patients, nor hyperglycemia. No case of glycosuria (Benedict and Fehling reagents) was observed during provoked hyperglycemia. The curves of provoked hyperglycemia in patients suffering from simple and moderate forms of pulmonary tuberculosis showed an almost identical aspect, characterized by a terminal glycemia, three hours after the onset of the test, with figures near those given by the initial glycemia. The figures of maximal glycemia in these patients are the same as those observed in normal persons, and the return of glycemia to normal is somewhat retarded. In patients suffering from grave forms of pulmonary tuberculosis the return of glycemia to normal conditions, after the test, is greatly retarded. Frequently the figures of terminal glycemia, three hours after the test, are higher than those given by the initial glycemia. The absence of glycosuria and the behavior of the glycemic curves during the test in patients suffering from moderate forms of pulmonary tuberculosis are explained as being caused by an insular hypofunction due to the hypo-alimentation of the patient, as well as to the general effects of the coexisting febrile and infectious conditions. The authors deny any specific influence of tuberculosis on the gluside metabolism.

Transplacental Heredity of Tuberculosis.—Palacios Costa and Falsia report the results of their experiments with the inoculation of amniotic fluid or macerated placenta from tuberculous women to guinea-pigs. They conclude that the transplacental infection by the tuberculous ultravirus is proved and that tuberculous infection of the amniotic fluid in cases in which the placenta is normal and, conversely, tuberculous infection of the placenta without contamination of the amniotic fluid are possible. Two patients, out of the group of three patients from whom the amniotic fluid was obtained, have corticopleural lesions and live in satisfactory conditions. The other patient in this group had fibrocaseous lesions and died twenty-three days after delivery of a living child. The woman who expelled the placenta used in the experiments had fibrocalcareous lesions. She lives also in satisfactory conditions. The four infants were separated from their mothers immediately, placed under good care and fed by wetnurses and are in good general condition and developing satisfactorily.

Archiv für Dermatologie und Syphilis, Berlin

170: 521-622 (Nov. 10) 1934. Partial Index

Formation of Porphyrin by Pathogenic Fungi of Skin. C. Carrie and A. S. von Mallinckrodt-Haupt, with Introduction by H. T. Schreus.—p. 521.
Exanthems Caused by Arsphenamine, Which Simulate Pityriasis Rosea and Lead to Atrophy. D. Steiger-Kazal.—p. 530.
Benign Acanthosis Nigricans. R. Bernhardt.—p. 533.
Hematologic Biochemical Changes in Blood in Administration of Neoarsphenamine. J. R. Bachromejew and L. N. Pawlowa.—p. 543.
*Changes in Teeth of Patients with Congenital Syphilis. J. Guszman.—p. 572.
*Treatment of Epidermophytosis of Feet and Hands. H. O. Loos.—p. 602.
Transmission Experiments on Lichen Ruber Planus by Transplantation into Cornea of Rabbits. R. Bezecny.—p. 615.

Anomalies of Teeth in Congenital Syphilis.—Guszman describes his observations on the teeth of 116 adults with congenital syphilis. He points out that there are a number of anomalies of the teeth the presence of which is considered suggestive of or characteristic for congenital syphilis. He mentions the following: (1) late second dentition, (2) microdontism, (3) absence of certain groups of teeth, particularly of the upper lateral incisors, (4) dystrophic crowns, that is, hypoplasia of the dental enamel with its numerous variations (apical and surface erosions, small circular or bowl-like erosions, "stair" teeth or the so-called cloves teeth), (5) atrophy of the chewing surfaces, particularly of the first molars, (6) abnormal position of the teeth, (7) "amorphic" teeth (so-called fish teeth), and (8) Hutchinson's teeth. The author considers Hutchinson's teeth the most important of the dental anomalies of congenital syphilis but admits that they are not frequent. He observed them in 12 per cent of his patients with congenital syphilis. In spite of opinions to the contrary, he asserts that really typical Hutchinson's teeth are found only in persons with congenital syphilis. Further he gives illustrations of fifteen different dental anomalies that he observed in his material: microdontism, absence of the two upper lateral incisors, large gaps between the teeth, hypoplasia of the upper median incisors, hypoplasia of the proximal portion of the crown of the upper median incisors, hypoplasia of the incisors and the canine teeth, crooked position of the teeth, misplacement of a tooth (so-called gum tooth), fish teeth, pointed teeth, typical Hutchinson's teeth, pivot tooth, teeth with half moon shaped erosions, wedge shaped cutouts on the upper median incisors and long amorphic teeth. The author admits that with exception of Hutchinson's teeth the anomalies are not a sufficient basis for a diagnosis of congenital syphilis, but they should be an inducement for further search for other symptoms, and in this manner they may lead to the discovery of the otherwise entirely latent congenital syphilis.

Epidermophytosis of Feet and Hands.—Loos studied the mode of infection, treatment and prophylaxis of epidermophytosis. In order to clarify the widely accepted belief that the pathogenic agent of mycotic eczema is mostly transmitted in public baths, sport institutes and similar establishments the author inspected a number of baths and conducted a careful search for pathogenic fungi of the skin. He thinks that the negative results of these investigations do not entirely refute the belief, since in the cultures the disturbing growth of mold fungi could not be excluded. In studying the treatment he tested a number of antimycotics. He determined their growth inhibiting action by adding them to the culture mediums and their fungicidal action by letting them act on fungous material. He found that an entirely satisfactory substance, one that is effective in all cases, is still lacking. However, the tests permitted a comparative evaluation of the various substances that are now available. He found brilliant green the most effective substance; then follow in the order of their effectiveness acriflavine hydrochloride, oxycyanate and solution of formaldehyde. Less effective are salicylic acid, benzoic acid and sulphur, and tar and alcohol have only a slight effect. Corrosive mercuric chloride, iodine and chlorine were especially fungicidal, while thymol inhibited the growth considerably. The metals were virtually ineffective. As most effective for the treatment he recommends brilliant green, benzoic acid and sulphur. The problem of prophylaxis is still unsolved. Nevertheless, it is possible to obtain certain successes. The author advises addition of chlorine to the bath water, cleaning the floors with phenol

(carbolic acid) and disinfection of bath sponges and other bath accessories with solution of formaldehyde, thymol or alcohol. He thinks that acid foot baths, alcohol rubs and the use of disinfecting powders (sulphur) are to be recommended for personal prophylaxis.

Deutsche medizinische Wochenschrift, Leipzig

60: 1743-1782 (Nov. 16) 1934

Development of Detachment of Retina and New Methods of Treatment. F. Poos.—p. 1743.
Pneumonias During Childhood. G. Fanconi.—p. 1746.
Asthmatic Attacks and Dyshidrosis Caused by Arsphenamine Preparations. A. Szarvas.—p. 1751.
*Acanthosis Nigricans in Gastric Carcinoma. K. Damblé.—p. 1752.
Practical Application of Law for Prevention of Defective Offspring. O. Pedersen.—p. 1753.
*Cephalic Index. Kruse.—p. 1755.

Acanthosis Nigricans in Gastric Carcinoma. — Damblé points out that acanthosis nigricans has been considered a complication of carcinomatosis, although there have been cases in which a malignant neoplasm was not demonstrable. Since acanthosis nigricans is still an object of discussion and is a rather rare condition, the author feels justified in reporting the history of a man who had carcinoma of the stomach and who developed acanthosis nigricans. In the bend of the elbows, in the axillae, on the dorsal surfaces of the hands and feet, in the back and especially on the inner surface of the thighs there were pigmented areas, about the size of lentils, deep black, slightly raised above the surface, segmented, indented and almost wartlike. In contradistinction to the otherwise rough skin, these areas felt like velvet. The scrotum and penis were almost black. The localizations of the pigmented areas tallied with those described in other reports, but the histologic aspect corresponded only to a certain extent with those formerly described. The author thinks that the differences in the microscopic aspects are due to the fact that the cutaneous changes had existed only a few weeks when the patient died.

Cephalic Index. — Kruse points out that Walcher, an obstetrician in Stuttgart, many years ago called attention to the fact that the shape of the head is largely determined by the fact whether the head of the young nursling is placed on a hard or a soft pillow. The author and his collaborator, M. Fischer, were able to corroborate this six years ago and Catel recently came to the same conclusion. He maintains that "environment" plays a much more important part in shaping the head than does heredity and concludes that the cephalic index is changeable and consequently cannot be considered a reliable indicator of race.

Klinische Wochenschrift, Berlin

13: 1561-1592 (Nov. 3) 1934. Partial Index

*Influence of Wavelength on Heat Distribution in Body in Case of Ultrashort Wave Therapy. A. Gebbert.—p. 1563.
*Modification of Regeneration of Erythrocytes by Follicular Hormone. T. Minouchi and H. Schwalm.—p. 1565.
Heat Regulation During Fever. D. Laszlo and M. Wachstein.—p. 1568.
Iodine Metabolism in Hyperthyroidism. L. Scheffer.—p. 1570.
Does Intracutaneous Reaction in Gonorrhea Have Diagnostic Significance? M. Thomas and L. Waldeyer.—p. 1572.
Fifth Primitive Arterial Arch in Roentgenogram. F. Kuhlmann and G. von der Weth.—p. 1578.
Diagnosis of Pregnancy by Means of Histidine Reaction in Urine. M. Weiss.—p. 1579.

Heat Distribution in Ultrashort Wave Therapy.—Gebbert describes experiments on the influence of wavelengths on the heat distribution in the body during ultrashort wave therapy. It is advisable to see that the distances between the electrodes are considerable, in order to produce a favorable percental depth action. The best medium between the electrodes and the body is air; however, for practical reasons other mediums may be interposed, so that the effect of distance is attained. A good glass or a loose felt of sufficient thickness has been used. The thickness of the interposed medium is determined by the size of the electrodes. There were no sharply defined heat maximums in the various substances that served as test materials (bread, meat, leg of a hog), and on which different wavelengths were tried. To effect a uniform absorption of heat by the different mediums —skin, flesh, muscles, bones and marrow—it proved necessary to use rather short wavelengths (between 3 and 6 meters). The author advises that, before resorting to ultrashort wave therapy of internal organs the relative heating of which is not known as yet, experiments should first be made on tissues that are stratified in a similar manner in order to determine the heating of the tissue in relation to the tissues in front and behind it. He suggests that these preliminary tests be made on a cadaver or on a phantom and thinks that this is the only way in which it can be determined how the ultrashort waves are best utilized.

Regeneration of Erythrocytes and Follicular Hormone.—Since certain clinical observations indicate a connection between blood regeneration and the function of the gonads, Minouchi and Schwalm decided to investigate this problem experimentally in rabbits. The counting and the differentiation of the reticulocytes served as a criterion for the regeneration. It was found that even the spontaneous regeneration following venesection takes a different course in normal mature rabbits from that in rabbits castrated for some time. In normal animals regeneration is effected by flooding out of an increased number of all forms of reticulocytes, and more young reticulocytes begin to appear only if the bone marrow is taxed again and again, so that it becomes exhausted. In castrated animals venesection is followed at once by a considerable increase in the younger forms, while the total number of reticulocytes is not greatly increased. The administration of estrogenic substance alone, without other stimulation of the erythropoiesis, effects only slight changes: in normal animals an increase in the younger forms, which lasts only a short while, but in castrated animals an increase that persists slightly longer. The combination of venesection and administration of estrogenic substance, however, has effects that differ considerably from those which appear after venesection alone: in normal animals there appears, in addition to an increase in the total number, also a considerable increase in the young forms, which may be interpreted as an intensive regeneration, a mobilization of all reserves; castrated animals, in which the function of the bone marrow is apparently impaired, react to this combined stimulation no differently than without the estrogenic substance. The authors conclude from this that estrogenic substance exerts a stimulating influence on the regeneration of the erythrocytes. To what extent these experimental studies can be applied to human subjects is yet to be determined.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

98: 129-192 (Nov.) 1934

*When Is It Permissible for a Woman, Who Has Had Eclampsia and Severe Pregnancy Nephropathy, to Conceive Again? L. Seitz.—p. 129.
*Birth Injuries of the Nose. L. Birke.—p. 144.
Infundibular Pregnancy: Case. P. Singer.—p. 153.
*With What Exactness Does Sedimentation Speed of Erythrocytes Permit Estimation of Inflammatory Genital Disorders? H. Guthmann and W. Neuhaus.—p. 157.
Clinical Aspects of Ruptures of Uterus. W. Maljawinsky.—p. 167.

Advisability of Renewed Conception After Eclampsia and Nephropathy.—Seitz shows that observations so far have proved that renal lesions resulting from eclampsia and nephrosis as a rule disappear within several weeks. To preclude a too early severe taxing of the organ and thus its prolonged impairment, the author considers it advisable to prevent a new conception for from six months to one year. As long as there exists a rather severe hypertension, or if casts and protein are excreted in considerable quantities by a woman with eclampsia or nephrosis who formerly had normal blood pressure, the physician should advise against a new pregnancy. If conception should take place, an expectant attitude should be taken. An interruption of the pregnancy is advisable only if it is found that a great exacerbation has set in and that threatening symptoms have appeared. The persistence of albuminuria, in which casts appear only in small numbers or are entirely absent, in which the blood pressure is normal and in which the functional tests of the kidney reveal fairly normal conditions, is no reason to advise against a new pregnancy. If, following a pregnancy nephrosis, there should actually develop a chronic nephritis or a contracted kidney, it is reasonable to take steps to prevent a new pregnancy. If under these conditions conception has taken place and severe disturbances in the compensation have set in, the pregnancy should be interrupted. The author points out that there are cases in which the most exact functional tests

no longer disclose an impairment of the kidney and in which a renewed pregnancy again leads to nephrosis and eclampsia. All methods known so far do not permit a definite evaluation of such cases during the period when the woman is not pregnant, and consequently nothing remains but to take a chance with a new pregnancy.

Birth Injuries of the Nose.—Birke observed nine cases of birth injury of the nose among 542 newly born infants. A connection with the process of birth was considered definitely established only in cases in which noticeable lesions of the skin existed over the injured area. In four of the nine cases the delivery had been complicated (forceps, twins, frontal presentation), and in the other five cases there existed first or second occipital positions together with a considerable disproportion between the fetal head and the birth channel. The nose injury was not treated in any of the cases. The author points out that fractures of the nasal bones heal more quickly than any other fractures. He calls attention to the fact that asymmetries of the nose of newly born infants are almost the rule (519 out of 542) but that a connection with the process of birth can be proved in but few cases.

Estimation of Genital Disorders by Sedimentation Speed of Erythrocytes.—Guthmann and Neuhaus determined the reliability of the sedimentation speed in the evaluation of inflammatory genital disturbances on the basis of 1,892 tests that were made in 1,138 cases. They determined the occurrence of certain values (10, 20, 30 cm. and so on after one hour) in various inflammatory disorders of the genitalia and found that the conformity between the severity of the disorder and the value of the sedimentation speed is most pronounced if the process is either severe or light. In processes of average severity there are considerable fluctuations, and the reliability is therefore correspondingly reduced. The authors compared the reliability of the sedimentation reaction and of the leukocyte count and found that the latter is more reliable in new processes, whereas the former is of greater importance in the estimation of subacute and chronic processes. In cases in which the inflammatory processes of the genitalia concurred with syphilis, it was found that the existence of syphilis does not noticeably diminish the reliability of the sedimentation reaction.

Münchener medizinische Wochenschrift, Munich

81: 1753-1788 (Nov. 15) 1934. Partial Index

Tonsils as Nutritive Medium for Bacteria and Etiology of Tonsillar Infections. M. Gundel.—p. 1753.
*Difficulties in Differentiation Between Syphilis and Tuberculosis of Upper Air Passages. J. Berendes.—p. 1755.
Necessity of Prevention of Goiter by Use of Iodized Salt in Germany and Its Relation to Eugenics. F. Fischler.—p. 1756.
What Is Best Method of Manual Artificial Respiration and in What Manner Is It Best Accomplished? C. J. Mijnlieff.—p. 1758.
*Dangers of Chemical Contraceptives. K. E. Fecht.—p. 1764.

Differentiation Between Syphilis and Tuberculosis.—Berendes calls attention to the similarity between the external manifestations and the histologic aspects of syphilis of the upper air passages and those of tuberculosis. Moreover, it has been observed that in cases of lupus of the skin or of the mucous membranes the Wassermann reaction is occasionally positive, in spite of the fact that syphilis is absent. The positive outcome of this reaction is thus not always a reliable indicator of the real nature of the disorder. On the other hand, it has been known that syphilis and tuberculosis existed together. However, it is much more frequent that in the upper air passages there occur disturbances in which syphilis is masked by tuberculosis. The microscopic examination of the lesions may reveal changes of a tuberculous character, but if they are in reality of a syphilitic nature much valuable time may be lost, for the lesions of tertiary syphilis may lead to ugly disfigurements in the face and to dangerous cicatrizations in the larynx and esophagus, which can be prevented if antisyphilitic treatment is begun early enough. The author describes four cases the histologic aspects of which suggested tuberculosis, but, since the serologic tests gave positive syphilis reactions, antisyphilitic treatment was instituted and, judging from the results obtained with this treatment, it must be concluded that the lesions were syphilitic rather than tuberculous. The author knows of no definite reason why the differentiation of syphilis and tuberculosis is difficult, especially when the upper air passages are concerned, but he assumes that the strongly lymphatic character of the lining membrane may be responsible.

Dangers of Chemical Contraceptives.—Numerous observations indicating the danger involved induced Fecht to call attention to chemical contraceptives, which are supposed to paralyze the motility of the spermatozoa. If the chemicals are rather concentrated, there is danger that they will injure the mucous membrane of the vagina and the uterus, particularly if used for long periods. Severe leukorrhea may develop, or erosions of the cervix and of the vagina. Chronic inflammation of the endometrium may spread to the uterine tubes, which may become obstructed and thus cause sterility. Since 1925 the author has observed 150 cases of primary and 200 cases of secondary sterility that could be traced to the use of chemical contraceptives. In addition to this he treated 275 cases of chronic endometritis and approximately 200 cases of inflammation of the tubes traceable to the continuous use of chemical contraceptives. Moreover, since chronic irritation may favor the development of carcinoma, he considers it possible that the chronic inflammations and erosions produced by contraceptives on the cervix and in the vagina may eventually lead to carcinoma, and he observed a number of cases of cancer in which this etiology seemed probable. The greatest danger of chemical contraceptives lies in the possibility that the spermatozoa may be damaged, although still remaining able to fertilize the ovum, and eventually lead to the development of defective offspring. He observed two cases, one with physical defects and another with both mental and physical defects, in which a causal connection with the effects of contraceptives was almost certain, while in three others there were indications that they were contributory factors in the development of defective offspring.

Wiener klinische Wochenschrift, Vienna

47: 1377-1408 (Nov. 16) 1934. Partial Index

*Animals as Carriers of Paratyphoid Bacilli: Significance for Human Beings. H. David.—p. 1377.
Experiences with General Anatomic Modeling Exercises. G. Sauser.—p. 1378.
Tuberculosis of Mediastinal Glands in Aged Persons. A. Arnstein.—p. 1383.
Elimination of Gonadotropic Hormone of Anterior Lobe of Hypophysis and of Female Sex Hormone (Follicle Hormone) in Manias, Depressions and Schizophrenia. W. Oesterreicher.—p. 1385.
Treatment of Osteomyelitis During Childhood. H. Salzer.—p. 1389.
Nutrition of Tuberculous Patients. W. Neumann.—p. 1390.

Animals as Carriers of Paratyphoid Bacilli.—David points out that there are different types of paratyphoid bacilli with distinct morphologic, biochemical, serologic and pathogenic characteristics and that the type determines to a large extent the symptoms of the disorder. Thus paratyphoid, the symptoms of which resemble typhoid, is generally caused by types A and B Schottmüller, whereas Breslau, Gärtner, Newport or similar strains of bacilli are usually detected in the gastro-intestinal forms. In animals, paratyphoid is caused either by types the pathogenicity of which for human subjects has not been proved as yet or by strains that cause the acute form in human subjects and are designated as the enteritis types (Breslau, Gärtner, Newport and others). After calling attention to the fact that these bacilli may not only cause disorders in the intestine of these animals but also invade the internal organs and the muscles, the author points out that the ingestion of meat from animals that have had an enteritis infection may cause meat poisoning in human subjects. Animals may become carriers of enteritis bacilli without showing symptoms of disease, and foods may become contaminated with their excretions or their meat may not be recognized as a possible source of disease. Moreover, cows that are carriers may produce contaminated milk, and milk products may likewise become infected. The author calls attention to the increasing incidence of food poisoning caused by meat from infected poultry and by eggs. Reports about eggs as sources of infections with Gärtner and Breslau bacilli have come from England, France and, particularly, Germany. Breslau and Gärtner infections have been traced also to rats and mice as carriers. In discussing the measures for the prevention of paratyphoid-enteritis infections the author stresses the necessity of eliminating animal carriers, and he recommends periodic examinations of live stock in order to detect them.

Zeitschrift f. Geburtshülfe u. Gynäkologie, Stuttgart

110: 1-104 (Nov. 20) 1934

*Beat Volume and Minute Volume of Heart at End of Pregnancy and Following Delivery. A. J. Anthony and R. Hansen.—p. 1.
*Pulse Wave Velocity in Aorta, in Femoral Artery and in Brachioradial Artery at End of Pregnancy and After Delivery. A. J. Anthony and R. Hansen.—p. 8.
Reactions of Gonadotropic Substances in Urine of Pregnancy to Acids and Bases. A. Westman, E. Jorpes and S. Linde.—p. 11.
Diagnostic and Prognostic Value of Aschheim-Zondek Reaction in Extra-Uterine Pregnancy. L. Morillo.—p. 18.
External Measurement of Uterine Contractions and Course of Delivery. H. Kolbow.—p. 38.
*Question Whether Puerperal Women Are Endangered by Enterococci. P. Hauptstein.—p. 54.
Aspects of Acid-Base Equilibrium During Pregnancy. J. Botella Llusiá. —p. 74.

Heart Action in Pregnancy and Following Delivery.—Anthony and Hansen point out that respiration and circulation are taxed more severely during pregnancy, but that the disturbances in the heart action cannot be estimated properly unless the behavior of the normal heart during pregnancy is understood. They studied the beat volume and the minute volume in a number of women before and after delivery, employing the physical method of Broemser and Ranke. They found that tests on different days revealed differences that may be observed also in healthy subjects. The beat volume is hardly ever changed by the delivery. A reduction of the systole during pregnancy is noticeable in but few cases. The diastole and the pulsation are always shorter at the end of pregnancy. Since the pulse frequency is greater during pregnancy than after delivery, the minute volume is likewise greater.

Pulse Wave Velocity in Pregnancy and After Delivery.—Anthony and Hansen determined the pulse rate before and after delivery with the method of Broemser and Ranke in the aorta, in the brachioradial artery and in the femoral artery. A tabular report shows the results of these tests, listing the systolic blood pressure, and the pulse rate in the three examined vessels before and after delivery. During pregnancy and the puerperium the pulse rates of the brachioradial artery and the femoral artery are about the same. This indicates that the elasticity of the vessels of the extremities is not noticeably changed during pregnancy, and there is no reason to assume that the tonus of the vascular muscles is changed during pregnancy. In the aorta, the velocity of the pulse wave is slightly reduced during pregnancy. The authors think that this may be due to the pressure of the enlarged uterus.

Enterococci During the Puerperium.—Hauptstein points out that, morphologically considered, the enterococcus is an oval, lancet-shaped diplococcus. He describes his studies on the significance of the enterococcus in puerperal women. He comes to the conclusion that the enterococcus is normally present in the lochia without endangering the puerperal woman. As regards its pathogenicity, it apparently takes a position intermediate between the virulent streptococci and the avirulent organisms, perhaps similar to that of the colon bacillus. Thus the uterus may harbor the enterococcus and yet puerperal fever need not develop. However, under certain conditions (long duration of delivery, stasis of the lochia and retention of the fetal membranes) enterococci may cause febrile disorders, and, if the enterococci have found in the uterus conditions that favor their growth and if the natural protective devices of the organism fail, the development of a hysterogenic enterococcic general infection is possible.

Zeitschrift für klinische Medizin, Berlin

127: 371-498 (Oct. 24) 1934. Partial Index

Utilization of Oxygen in Periphery in Various Degrees of Experimental Stasis. O. Klein and E. Spiegl.—p. 371.
Absolute Arrhythmia. K. Lühr.—p. 392.
*Specific Dynamic Action of Foods in Endogenic Forms of Obesity and Their Modification by "Thyrotropic" Hormone. A. Sylla.—p. 396.
Formation of Gibbus in Tetanus. G. Nagy.—p. 434.
*Cutaneous Manifestations in Caisson Disease. K. Mellinghoff.—p. 457.
*Aspects of Günther's Congenital Porphyria. A. H. Müller.—p. 460.

Specific Dynamic Action of Foods in Obesity.—Sylla says that by determining the basal metabolism two forms of obesity may be differentiated, one with a subnormal metabolic rate and one with a normal or supernormal rate. The obesity with lowered basal metabolism is considered of thyrogenic origin, while the form in which the metabolism is normal or supernormal is considered hypophyseal in origin. In most of the patients with thyrogenic obesity the action of the foods is not greatly impaired, but hypophyseal obesity is characterized by a reduction in the action of the food. Deviations from this rule must be considered polyglandular disturbances. The hypophyseal action on the metabolism probably takes place largely by way of the thyroid. The active principle is contained in the "thyrotropic" hormone. The author demonstrates in five cases how the reduced food action may be normalized by means of the thyrotropic hormone. The body weight of these patients decreases and thus this treatment gives prospects of a causal therapy of endocrine obesity.

Cutaneous Manifestations in Caisson Disease.—Mellinghoff observed on the extremities and to a lesser degree on the trunk of a patient with severe caisson disease a clear marmoration of the skin. When the patient coughed or was subjected to Valsalva's experiment, the marmoration became more noticeable. It disappeared gradually, but at first it had a tendency to recur while the patient was coughing. The author attempts an explanation of these cutaneous manifestations and in the conclusion he points out that only in the severest cases, in which the skin is dark blue and swollen, does the cutaneous stasis play an important part in the course of caisson disease, for in this event considerable quantities of blood may be stored in the skin so that there is, so to speak, a bleeding under the skin, a process that may exacerbate the circulatory collapse of patients with severe caisson disease. The cutaneous symptom is significant also, because fine marmorization may develop quite early at a time when all other signs of caisson disease are still absent. The patient likewise had noticed these signs but had paid no further attention to them. In looking for this sign, one may recognize persons who are likely to develop caisson disease. Such patients should avoid work that leads to caisson disease, or they should receive special medical attention.

Aspects of Günther's Congenital Porphyria.—Müller reports the history of a man, now aged 63, who from early youth had suffered from skin eruptions in the form of blisters that existed for from eight to ten days and then disappeared again. At first the eruption appeared on the hands, but later also on the face. The eruption did not cause itching, but the rupture of the blisters was accompanied by a burning pain. The blisters used to be the size of a bean but in recent years they reached the size of a silver dollar (38 mm.). After the blisters rupture, they dry up and a white tissue forms at their base; this remains for several months, is shed and sores form, which discharge a yellowish white fluid. These heal slowly but leave deep tissue defects and brownish spots. The skin appears tightly drawn over the bones and in some portions it is hard. The auricles have been partly destroyed and the neck shows scars and depigmentation, as do also the hands. The patient noticed that the blisters developed with greater frequency during the spring and summer. He had a hypersusceptibilty of the skin to exposure to the sun and to rays from artificial light sources, but he never protected himself against sun rays. For years he had excreted large amounts of porphyrin. In the urine the uroporphyrin and the coproporphyrin were increased and in the blood even more so. At times, the porphyrin concentration of the blood surpassed that of the urine. The feces likewise contained excessive amounts of coproporphyrin. Moreover, coproporphyrin and uroporphyrin were found in the gastric juice and in the hepatic bile, and the porphyrin was increased in the gallbladder. The sputum was free from porphyrin. Examination of the nervous system revealed no abnormalities, and the digestive tract was free from changes traceable to the primary disease. However, the calcium and iron metabolisms were highly abnormal. The changes in the calcium metabolism became manifest primarily in the bone structure. Whereas roentgenoscopy disclosed a considerable increase in thickness and density on the cranial bones, other portions of the skeletal system proved deficient in calcium. To prove that there is a connection between porphyria and the calcium metabolism, the author calls attention to the experimental porphyrin deposits in growing bones and in callus and to efforts to cure rickets by porphyrin. The patient also had a hypochromic anemia with a decrease in the

resistance of the erythrocytes, an eosinophilia and disturbances of the renal function. On the basis of these observations the author concludes that it cannot be doubted that this is a case of congenital porphyria. He attempts a uniform explanation of all disturbances that are accompanied by a disturbance in the porphyrin elimination. Among other things he points out that the clinical aspects of porphyrin diseases make the relations between porphyrin and calcium, or a disturbance in the calcium metabolism, the probable cause of disturbances in the neuroregulation of the sympathetic functions.

Zentralblatt für Gynäkologie, Leipzig

58: 2705-2768 (Nov. 17) 1934

Ovarian Tumor of Thyroid Tissue. O. Frankl.—p. 2706.
Resumption of Atmocausis of Uterus. H. Fuchs.—p. 2711.
Tubal Pregnancy Following Implantation of Uterine Tubes. C. Brunner.—p. 2715.
Eclampsia Problem. P. Goldschmidt-Fürstner.—p. 2716.
*New Method of Obtaining Secretion from Puerperal Uterus. L. Bublitschenko and E. Dertschinsky.—p. 2722.
Medicinal Treatment of Asphyctic New-Born. K. E. Fecht.—p. 2725.
*Formation of Vagina by Means of Modified Skin Graft Method. F. P. Matwejew.—p. 2727.

Method of Obtaining Secretion from Puerperal Uterus. Bublitschenko and Dertschinsky think that the detection of bacteria in the uterus of healthy women can perhaps be explained by mistakes in the withdrawal of specimens from the uterus. They maintain that neither Döderlein's cannula nor Walthard's rod precludes the transfer of an infection from the cervix into the uterus, and for this reason they devised a new technic. The lochia are withdrawn from the uterine cavity by means of a syringe to which a Braun catheter has been attached. The opening of the latter has been made wider for this purpose. The syringe is covered with a sterilized condom. Following disinfection of the external genitalia, the vagina is opened by spoonlike specula. The cervix is cleansed with sterile cotton, and Braun's catheter together with the covering condom is introduced into the cervical canal up to the internal os. A wire mandrin perforates the condom, so that owing to its elasticity it glides downward. At the same time Braun's catheter is pushed into the uterine cavity, the syringe is operated and a specimen of the uterine content is obtained. The authors are convinced that this technic makes impossible a transfer of the contents of the cervix into the uterus and they conclude that in the greatest majority of puerperal women, in whom the temperature did not increase, the uterine contents were sterile.

Formation of Vagina by Means of Skin Grafts.—Matwejew, after calling attention to the disadvantages of artificial vaginas formed from the small or large intestine, describes an operation that he employed successfully in eight patients in whom vagina and uterus were completely absent. In the last operation of this type, which he performed in 1932, he modified his original method slightly in that the flaps were removed from the thigh in such a manner that the lower freshened edge of the lateral flaps, at the site of their connection with the matrix, was not at the lower freshened edge of the upper flap but 0.75 cm. higher. If this is done, the upper flap is cut from the skin and the mucous membrane of the vaginal introitus and of the perineum in the form of a rectangle, 4 cm. in width and from 6 to 7 cm. in length, so that its upper edge is 3 mm. below the urethral opening. This flap is lifted and underneath it, partly with a knife and partly by blunt methods, a canal, from 10 to 11 cm. in length and 5 cm. in width, is formed between the rectum and the urethra. Following this two flaps, from 10 to 12 cm. in length and 5 cm. in width, are cut from the inner surface of the thighs almost parallel to the labia majora. A thin layer of fat is removed with the flaps. At the lower edge the flaps remain connected with the skin of the thigh. The flaps are sutured together in such a manner that they form a tube; this is placed in the preformed canal and is sutured into position. Then a loose gauze tampon is introduced into the newly formed vagina and is left there for four or five days. Care must be taken that the tampon is neither too tight nor too loose, for in the first instance necrosis might result and in the second event displacement is likely. He suggests that instead of the gauze tampon a sponge cylinder may eventually be used. He asserts that the immediate as well as the late results of his method are favorable.

Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

78: 5433-5524 (Dec. 1) 1934

Nasopharyngeal Fibroma. C. E. Benjamins.—p. 5434.
*One Thousand One Hundred and Forty Seven Examinations of Syphilis According to New Cataphoretic Serum Reaction. L. J. Delbaere.—p. 5442.
Influence of Xerophthalmia and Other Frequent Ocular Diseases on Amount of Blindness in a Country. J. Tijssen.—p. 5452.
Possibility of Pregnancy After Inflammation of Both Ovaries. H. Heymans Van Amstel.—p. 5459.

Cataphoretic Serum Reaction in Syphilis.—Delbaere describes a serologic reaction for syphilis based on the lowered electrical charge carried by antigen particles suspended in a syphilitic serum. The amount of this decrease of charge is measured by means of the cataphoretic displacement rate of these particles, which is compared to that of a lipoid dye, simultaneously suspended in the serum. By means of the results obtained with this reaction in 1,147 serums, which were at the same time submitted to the Wassermann reaction and two of the usual flocculation reactions, it proved that this reaction is more sensitive than the extremely sensitive Müller reaction. The author, therefore, does not doubt its specificity.

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96: 1201-1228 (Nov. 8) 1934

*Traumatic Fat Embolism. E. H. Hansen.—p. 1201.
Urticaria Factitia. K. H. Baagøe.—p. 1211.

Traumatic Fat Embolism.—Of the eight cases of respiratory and cerebral forms of fat embolism reported, the first presented clinically and anatomopathologically a characteristic picture of the cerebral form and is described in detail by Hansen. A free interval of about eighteen hours followed fracture of the femur, humerus, radius and patella in an automobile accident. The patient then became unconscious during sleep; there were involuntary urination and accelerated pulse, and somewhat later rise of temperature and bloody, coffee ground vomit. Death occurred about fifty-eight hours after the accident. Microscopically fat emboli were seen in the lesser and the greater circulation. The author says that in the respiratory form of fat embolism diagnosis is sometimes impossible and in other cases difficult, especially when the picture resembles that of wound shock. A free interval and rise of temperature should suggest fat embolism. In bronchopneumonias after trauma, fat embolism should be considered. The symptoms of the cerebral form of fat embolism should be borne in mind in puzzling and unexpected general cases after fractures and other traumas. In fatal cases following traumas, especially fractures, fat embolism should be looked for, particularly in the absence of lesions which in themselves satisfactorily explain the outcome. Prophylaxis seems to be of doubtful value and no treatment has given convincing results. Attempts to avoid the entrance of more fat into the blood stream are regarded as rational. A case is cited to illustrate probable spontaneous recovery after fat embolism.

96: 1229-1252 (Nov. 15) 1934

*Intestinal Invagination in Childhood. L. Ø. Christensen.—p. 1229.

Intestinal Invagination in Childhood.—Of fifty-four cases reported in fifty-two children, thirty-four in boys and eighteen in girls, thirty occurred in children less than 1 year of age; the oldest child was 12. The mortality was 16.6 per cent. In Christensen's opinion, bloodless treatment is indicated in fresh cases, particularly in the first year of life, when the general condition is greatly affected; if observation in the following hours shows reposition to have failed, there is a possibility that improvement in the general condition will afford a better outlook for operative intervention. The normal operative method used was laparotomy through incision of the right side of the rectus. The author says that, while the importance of rapid operation has frequently been emphasized, the greatest care in treatment of the intestine is a factor no less important. Resection in small children should be a last refuge, and recovery is seen after conservative treatment of apparently grave cases. Eventration of the intestine should be avoided as far as possible. Reposition can often be done intraperitoneally. The lines of treatment for invagination are not yet fixed, but the tendency is in the direction of surgical treatment as the normal method.